Vol. 1014 Number 3

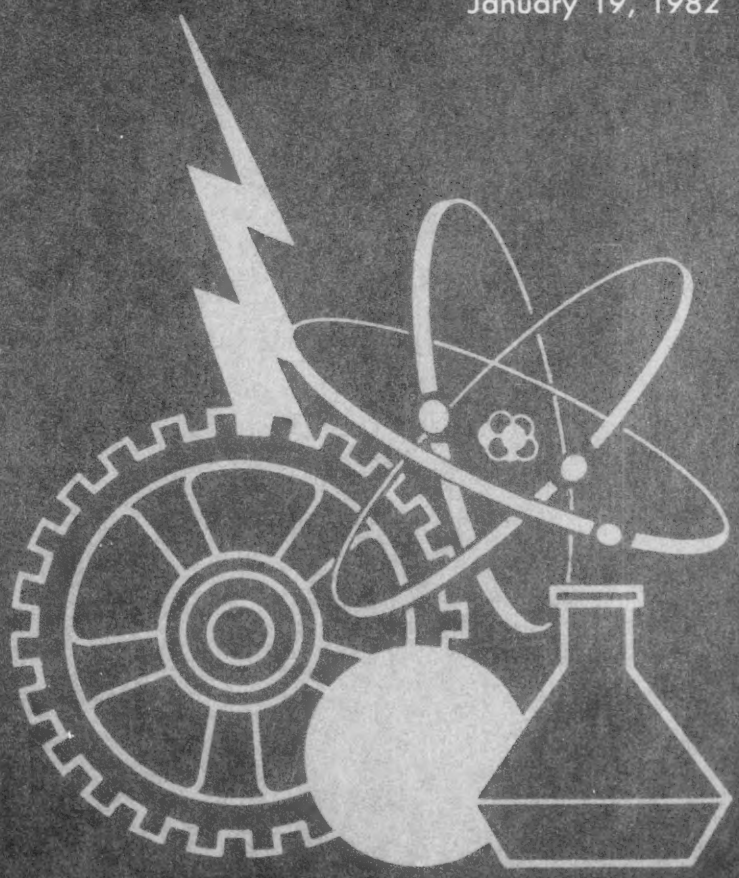
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

January 19, 1982



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

January 19, 1982 Volume 1014 Number 3

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1014 OG 206
Reissue Applications Filed	1014 OG 206
Request for Reexamination Filed	1014 OG 206
Patent Certificates of Correction	1014 OG 207
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1014 OG 208
Condition of Patent Applications	1014 OG 208
Reissue Patents Granted (30,848)	785
Plant Patents Granted (4,796)	787
Patents Granted	
General and Mechanical (4,310,925)	789
Chemical (4,311,478)	979
Electrical (4,311,869)	1087
Design Patents Granted (262,655)	1159
Index of Patentees	PI 1
Indices of Reissue, Design and Plant Patentees	PI 40
Classification of	
Patents (Including Reissues)	PI 45
Designs and Plants	PI 47
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 48
Designs and Plants	PI 49
Change of Address Form and Subscription Order Form	Back Page

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT, consult Chapter 1800 of the Manual of Patent Examining Procedure and notices 90–95 in the consolidated listing of notices appearing in the Official Gazette of Jan. 6, 1981.

The PCT fees in effect after May 19, 1981 are as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Basic Fee (for the first 30 sheets of an international application)	215.00
Basic Supplemental Fee (for each sheet over 30)	4.00
International Designation Fee (for each State for which a national patent is sought, or group of States for which the same regional patent is sought)	50.00

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,405,381, Re. S.N. 310,331, Filed Oct. 9, 1981, Cl. 338/254, THIN FILM RESISTOR, Felix Zandman, et al., Owner of Record: *Vishay Intertechnology, Inc., Malvern, Pa.,* Attorney or Agent: Thomas M. Ferrill, et al., Ex. Gp.: 213

4,168,677, Re. S.N. 304,892, Filed Sept. 23, 1981, Cl. 119/14.18, SANITARY BACKWASHING SYSTEM FOR AUTOMATIC MILKING MACHINES, Michael J. Brown, Owner of Record: *Inventor,* Attorney or Agent: William C. Cahill, et al., Ex. Gp.: 333

4,174,948, Re. S.N. 309,196, Filed Oct. 5, 1981, Cl. 432/54, MANIFOLD INPUTS AND OUTPUTS FOR FURNACE REGENERATORS, Robert O. Bradley, et al., Owner of Record: *Toledo Engineering Co., Toledo, Ohio,* Attorney or Agent: Hugh A. Kirk, Ex. Gp.: 344

4,223,433, Re. S.N. 305,216, Filed Sept. 24, 1981, Cl. 29/509, METHOD OF JOINING WORKPIECES WITH A RIVET FASTENER SYSTEM, Irwin E. Rosman, Owner of Record: *Inventor,* Attorney or Agent: Donald D. Mon, Ex. Gp.: 321

4,224,164, Re. S.N. 298,675, Filed Sept. 2, 1981, Cl. 210/321, NON-WICKING POLYURETHANE CASTING SYSTEMS, Melvin Brauer, Owner of Record: *N L Industries, Inc., New York, N.Y.,* Attorney or Agent: Donald L. Traut, et al., Ex. Gp.: 177

4,268,830, Re. S.N. 300,341, Filed Sept. 8, 1981, Cl. 343/103, SELF CALIBRATION OF A LORAN-C NAVIGATION RECEIVER, Lester R. Brodeur, Owner of Record: *Sanders Associates, Inc., South Nashua, N.H.,* Attorney or Agent: Louis Etlinger, Ex. Gp.: 222

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,751,115, Reexam. No. 90/000,116, Requested: Nov. 30, 1981, Cl. 299/92, TOOLS AND HOLDERS THEREFOR, Sidney E. Proctor, Owner of Record: *Anderson-Strathclyde, Ltd., High Wycombe, England,* Attorney or Agent: Finnegan, Henderson, et al., Ex. Gp.: 350, Requester: Anderson-Strathclyde, Ltd., High Wycombe, England

3,950,850, Reexam. No. 90/000,129, Requested: Dec. 21, 1981, Cl. 433/201, DENTAL PROSTHETIC IMPLANTS, Thomas D. Driskell, et al., Owner of Record: *Miter, Inc., Worthington, Ohio,* Attorney or Agent: Frank H. Foster, Ex. Gp.: 143, Requester: Ronald L. Grudziecki, et al., Alexandria, Va.

4,034,772, Reexam. No. 90/000,125, Requested: Dec. 14, 1981, Cl. 135/4R, VAULTED MEMBRANE SHELTER, Carl F. Huddle, Owner of Record: *Tension Structures Co., Pleasant Ridge, Mich.,* Attorney or Agent: None, Ex. Gp.: 350, Requester: Carl F. Huddle, Hottel Corp., Pleasant Ridge, Mich.

4,070,256, Reexam. No. 90/000,126, Requested: Dec. 18, 1981, Cl. 204/55R, ACID ZINC ELECTROPLATING AND PROCESS, Grace F. Hsu, et al., Owner of Record: *Minnesota Mining & Manufacturing Co., St. Paul, Minn.,* Attorney or Agent: 3M Co. Patent Counsel, Ex. Gp.: 110, Requester: George B. Rynne, Atlanta, Ga.

4,261,953, Reexam. No. 90/000,122, Requested: Dec. 10, 1981, Cl. 422/162, LIME SLAKING APPARATUS, Henry J. Gisler, Owner of Record: *Joy Manufacturing Co., Pittsburgh, Pa.,* Attorney or Agent: J. Steward Brams, Ex. Gp.: 170, Requester: Joy Manufacturing Co., Pittsburgh, Pa.

PATENT NOTICES

Certificates of Correction for the Week of Jan. 19, 1982

Re. 30,714	4,269,783	4,287,077	4,293,636
D. 260,984	4,270,136	4,287,404	4,293,815
3,839,460	4,270,168	4,287,452	4,294,169
3,843,683	4,274,919	4,287,654	4,294,620
4,031,044	4,276,769	4,288,276	4,294,684
4,070,329	4,279,830	4,288,562	4,294,752
4,100,133	4,280,726	4,288,862	4,294,906
4,205,914	4,281,068	4,288,984	4,294,955
4,208,910	4,281,200	4,289,112	4,295,041
4,214,009	4,281,318	4,289,274	4,295,048
4,215,208	4,281,396	4,289,371	4,295,176
4,220,784	4,281,645	4,289,424	4,295,269
4,223,893	4,282,228	4,289,581	4,295,505
4,227,055	4,282,229	4,290,023	4,295,932
4,231,174	4,282,543	4,290,041	4,296,357
4,233,723	4,282,808	4,290,349	4,296,670
4,236,331	4,283,372	4,290,496	4,296,795
4,240,891	4,283,498	4,291,095	4,297,098
4,242,466	4,283,515	4,291,198	4,297,261
4,243,403	4,283,945	4,291,231	4,298,001
4,245,701	4,284,082	4,291,618	4,298,210
4,247,633	4,284,407	4,291,888	4,298,263
4,250,094	4,284,823	4,291,893	4,298,306
4,251,842	4,284,949	4,292,073	4,298,349
4,252,791	4,285,226	4,292,892	4,298,437
4,253,461	4,285,497	4,292,955	4,298,481
4,256,759	4,285,512	4,292,969	4,298,713
4,259,117	4,285,575	4,293,007	4,298,959
4,266,201	4,285,917	4,293,060	4,298,979
4,267,110	4,286,471	4,293,310	4,299,466
4,267,962	4,286,652	4,293,582	4,299,520
4,269,494	4,286,775	4,293,605	4,299,988
4,269,637	4,286,847		

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 222
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF November 28, 1981

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-23-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-06-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	9-15-80
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	11-14-80
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	9-17-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	8-08-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	6-11-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—VACANT ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-06-80
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	12-07-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-06-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	3-14-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	4-23-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	6-04-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	3-17-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	10-22-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during November 1981, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,154,787 to 3,158,866, inclusive

Plant Patents ..... Numbers 2,451 to 2,454, inclusive

REISSUES

JANUARY 19, 1982

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,848

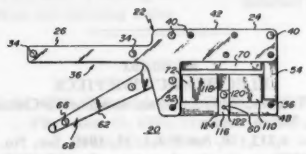
HAND TOOL FOR JOINING OBJECTS

Michael Bauerkemper, Cerritos, Calif., assignor to Thomas & Betts Corporation, Raritan, N.J.

Original No. 4,070,754, dated Jan. 31, 1978, Ser. No. 735,008, Oct. 22, 1976. Application for reissue Jun. 13, 1979, Ser. No. 48,134

Int. Cl.³ H01R *43/04*

U.S. Cl. 29—749 **20 Claims**



1. A hand tool for joining two or more objects together comprising: a frame member having a first end portion, a second end portion and an intermediate portion therebetween; a movable support member having first and second ends, said first end pivotally coupled to said intermediate portion of said frame member to permit movement of said support member second end with respect to said frame member second end portion; a latch bar pivotally coupled to said second end of said support member and releasably coupled to said frame member second end portion to prevent relative movement of said support member with respect to said frame member; handle means having first and second ends, [said second end of said handle means pivotally coupled to said intermediate portion of said frame member;] presser plate means; first coupling means coupled to said presser plate means and said frame member between said intermediate portion and said second end portion; and second coupling means coupling said presser plate *means* to said second end of said handle means; the arcuate movement of said first end of said handle means towards said first end portion of said frame member driving said presser plate *means* axially towards said support member.

Re. 30,849

ANTI-SIPHON AND BACKFLOW PREVENTION VALVE

Buckley Crist, Plainfield, N.J., assignor to Jaclo, Inc., Brooklyn, N.Y.

Original No. 3,951,164, dated Apr. 20, 1976, Ser. No. 547,934, Feb. 7, 1975. Application for reissue Dec. 22, 1980, Ser. No. 219,322

Int. Cl.³ F16K *24/00*

U.S. Cl. 137—218 **8 Claims**

7. A valve for preventing backflow and siphoning, comprising:

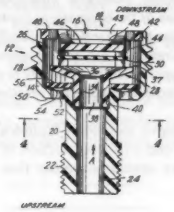
a. a valve body defining a chamber, the valve body including an inlet leading into the chamber and an outlet leading out of the chamber, and at least one air port in the chamber,

b. a first flow path running from the inlet through the chamber to the outlet,

c. check valve means located within the chamber and controlling flow in *and normally closing* the first flow path,

d. a second flow path running from the air port, by-passing the check valve means, through the chamber to the outlet, and

e. air valve means operable independently of the check valve means and operative hydraulically downstream of the check valve means, the air valve means including a closing member located across the second flow path in alignment over *and normally closing* the air port, the closing member being mated against the air port to prevent flow in the second flow path during a positive pressure condition within the chamber and being opened by a negative pressure condition in the second flow path to permit pressure equalization.



8. A valve as set forth in claim 7 wherein the valve body includes a plurality of air ports, said air ports circumferentially surrounding the check valve, the second flow path leading from said air ports through the chamber to the outlet.

Re. 30,850

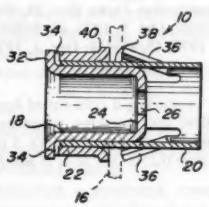
SELF-RETAINING CONDUIT ANCHORING DEVICE

Donald G. Gordy, and David P. Klosterman, both of Moberly, Mo., assignors to Orscheln Co., Moberly, Mo.

Original No. 4,131,379, dated Dec. 26, 1978, Ser. No. 872,912, Jan. 27, 1978. Application for reissue Aug. 25, 1980, Ser. No. 180,527

Int. Cl.³ F16B *9/00*

U.S. Cl. 403—197 **9 Claims**



4. [Apparatus as defined in claim 1, where] *A self-retaining anchoring assembly for mounting a coaxial cable within a through bore defined in a support member, said coaxial cable including concentrically arranged inner and outer member, comprising*

(a) an inner sleeve member having at one end radially outwardly extending first abutment means, said inner sleeve member including adjacent its other end internal stop means arranged for engagement by the extremity of the outer cable member when said cable member is introduced axially into said inner sleeve member from said one end thereof with the inner cable member projecting from the other end thereof;

(b) an outer sleeve member mounted concentrically about said inner sleeve member, said outer sleeve member being in abutting engagement at one end with said inner sleeve first abutment means, said outer sleeve member including adjacent said one end radially outwardly extending second abutment means; and

(c) an annular collar member arranged concentrically about

said outer sleeve member and in abutting engagement at one end with said outer sleeve second abutment means;

(d) said outer sleeve member including adjacent its other end a plurality of integral, circumferentially spaced external resiliently outwardly biased prong portions that extend at one end in the direction of the said outer sleeve member one end, the extremities of said prongs being spaced from the other end of said collar member a distance equal to the thickness of said support member, whereby when the end of the anchoring assembly adjacent the said other end of said outer sleeve member is progressively introduced within the support bore to a position in which the other end of said collar member is in engagement with one face of the support member, the extremities of the prong members, following inward compression during insertion of the outer sleeve member within the support bore, are resiliently expanded outwardly to positions in which the prong extremities are in engagement with the opposite face of the support member, thereby to prevent axial displacement of the anchoring assembly relative to the support member;

(e) said inner sleeve member [includes] *including* adjacent its said other end a tubular portion of reduced inner diameter having an annular shoulder that defines said internal stop means.

Re. 30,851

METHOD FOR PRODUCING LOW-CARBON COLD ROLLED STEEL SHEET HAVING EXCELLENT COLD WORKING PROPERTIES AND AN APPARATUS FOR CONTINUOUS TREATMENT THEREOF

Kenzo Toda; Hisashi Gondo, both of Tokyo; Bunichiro Kawasaki, Hikari; Mitsunobu Abe, Tokyo; Ryoseki Katsutani, Kisarazu; Tsuyoshi Kawano, Kitakyushu; Norimasa Uehara, Kimitsu; Yoshio Saito, Futtsu; Kenichiro Suemune, Kitakyushu; Masahiko Shiraishi, Nakatsu; Yoshifumi Tadashige, Kisarazu; Masao Morimoto, Yokohama; Takao Tsukamura, Funabashi; Kurayoshi Watanabe, Tokyo, and Teruhiko Nishimura, Kisarazu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Original No. 3,806,376, dated Apr. 23, 1974, Ser. No. 102,671, Dec. 30, 1970. Application for reissue Feb. 28, 1980, Ser. No. 125,749

Claims priority, application Japan, Dec. 30, 1969, 44/105435; Feb. 26, 1970, 45/15891; Oct. 9, 1970, 45/88988; Dec. 1, 1970, 45/105457; Dec. 1, 1970, 45/105458; Dec. 1, 1970, 45/106063

Int. Cl.[3] C21D *9/48*

U.S. Cl. 148—12 C **8 Claims**

1. A process for producing a cold-rolled low-carbon steel sheet having excellent cold-working properties, comprising the steps of *adjusting the amounts of Mn, O, S in a low-carbon steel containing less than 0.25% Mn so as to satisfy the following relation:*

$$Mn(\text{percent}) - \frac{55}{16}O(\text{percent}) - \frac{55}{32}S(\text{percent}) = 0 - 0.15$$

hot rolling the steel, coiling the hot rolled steel sheet at temperatures between 600° to 800° C., cold rolling the hot rolled steel sheet, feeding [a] *said* low-carbon steel sheet which has been reduced to the product gage [after having been hot and cold rolled in the conventional way] continuously through a continuous annealing furnace consisting of heating, soaking and overaging chambers, heating the steel sheet in the heating chamber to a temperature in the range of 700° to 900°, feeding the thus heated steel sheet directly from the heating chamber into and through the soaking chamber so that the sheet is in the soaking chamber at a temperature in the above range for a time required for recrystallization and growth of crystal grain in the steel sheet, rapidly cooling the steel sheet coming from the soaking chamber to an overaging temperature at a rate so that the carbon contained in the steel sheet is in a super-saturated solid solution before overaging, feeding the thus cooled [and] steel sheet directly into and through the overaging chamber so that the sheet is in the overaging chamber for a time not exceeding 8 minutes for precipitating carbon contained in the steel sheet and fixing it as a carbide so as to give the steel excellent cold working property, cooling the thus overaged steel sheet coming from the overaging chamber down to less than 50° C. and directly feeding the steel sheet through a skin pass mill to subject it to temper rolling and then directly feeding the temper rolled steel sheet to a leveller for leveling it before it is recoiled.

Re. 30,852

ELECTRONIC TIMEPIECE

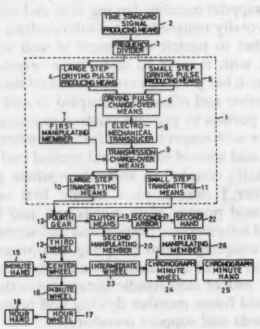
Munetaka Tamaru, Tokyo, Japan, assignor to Citizen Watch Co., Inc., Tokyo, Japan

Original No. 4,212,158, dated Jul. 15, 1980, Ser. No. 947,151, Sep. 29, 1978. Application for reissue Jan. 23, 1981, Ser. No. 227,989

Claims priority, application Japan, Sep. 30, 1977, 52-118092

Int. Cl.[3] G04C *3/00*; G04B *27/00*

U.S. Cl. 368—80 **7 Claims**



1. An electronic timepiece comprising: display means having a plurality of hands for displaying time;

first means for producing a first pulse train of a first predetermined frequency;

second means for producing a second pulse train of a second predetermined frequency less than said first predetermined frequency;

switch means for selecting one of said first or second pulse trains and providing the selected pulse train at its output;

an electro-mechanical transducer for converting said selected pulse train into rotary motion;

transmission means for transmitting the rotary motion of said electro-mechanical transducer to said hands of said display means, said transmission means having first and second drive ratios; and

means for changing said drive ratio of said transmission means in response to the change in said selected pulse train by said switch means.

PLANT PATENTS

GRANTED JANUARY 19, 1982

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,796
ROSE PLANT
O. L. Weeks, 4759 Philadelphia St., Chino, Calif. 91710
Filed Aug. 11, 1980, Ser. No. 177,261
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—2 1 Claim

1. A new and distinct climbing variety of rose plant substantially as shown and described, which is a sport of the bush variety described in U.S. Plant Pat. No. 4,552, characterized particularly by its climbing habit of growth producing long canes and the habit of bearing flowers on stems which grow as laterals from the climbing canes.

4,797
ROSE PLANT
O. L. Weeks, 4759 Philadelphia St., Chino, Calif. 91710
Filed Aug. 11, 1980, Ser. No. 177,262
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—3 1 Claim

1. A new and distinct climbing variety of rose plant, substantially as shown and described, which is a sport of the bush variety described in U.S. Plant Pat. No. 3,719, characterized particularly by its climbing habit of growth producing long canes and the habit of bearing flowers on stems which grow as laterals from climbing canes.

4,798
ROSE PLANT—JP 435
Reimer Kordes, Sparrieshoop, Fed. Rep. of Germany, assignor to Jackson & Perkins Company, Medford, Oreg.
Filed Aug. 5, 1980, Ser. No. 175,491
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—11 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its medium size (4½') bush, orange and yellow flowers, short peduncles having both glands and prickles and its very slight to non-existent fragrance.

4,799
ROSE PLANT
Mathias Tantau, Uetersen, Fed. Rep. of Germany, assignor to Jackson & Perkins Company, Medford, Oreg.
Filed Aug. 8, 1980, Ser. No. 176,599
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—15 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of orange-yellow to yellow flowers on medium length stems, average thorniness and a light licorice fragrance.

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4,800
COMPACT CORTLAND APPLE TREE—LAMONT CULTIVAR
George LaMont, Albion, N.Y., assignor to Stark Brothers Nurseries & Orchards Company, Louisiana, Mo.
Filed Apr. 21, 1980, Ser. No. 141,974
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—34 1 Claim

1. A new and distinct variety of apple tree which is a limb mutation of the standard Cortland apple tree (non-patented), substantially as shown and described, characterized by a compact vigorous growth habit, and the ability to bear fruit on spurs produced in greater numbers per linear foot on two, three, and four year old wood.

4,801
APPLE TREE
John W. Garretson, Yakima, Wash., assignor to Carlton Nursery Company, Inc., Dayton, Oreg.
Filed Nov. 30, 1979, Ser. No. 99,091
Int. Cl.[3] A01H 5/03
U.S. Cl. Plt.—35 1 Claim

1. A new and distinct variety of apple tree, substantially as described and shown herein, distinguished principally from other varieties of its type by its compact, dwarf growth habit.

4,802
BURN-RESISTANT JAPANESE YEW
Platt W. Hill, West Dundee, Ill., assignor to D. Hill Nursery, Union, Ill.
Filed Nov. 28, 1979, Ser. No. 98,076
Int. Cl.[3] A01H 7/00
U.S. Cl. Plt.—50 1 Claim

1. The new and distinct variety of "*Taxus cuspidata* Spring Green" plant as described and illustrated in the foregoing specification characterized particularly by hardy resistance to stunting of growth and browning of foliage caused by winter burn.

4,803
ILEX PLANT—MESDOB VARIETY
Kathleen K. Meserve, St. James, N.Y., assignor to The Conard-Pyle Company, West Grove, Pa.
Filed Jun. 26, 1980, Ser. No. 163,272
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—65 1 Claim

1. A new and distinct variety of Ilex, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of:

(a) a well-branched, symmetrical, compact, vigorous habit of growth which is well-adapted to a wide range of landscape uses,

(b) an abundance of staminate flowers which appear in spring and which produce the pollen necessary for fertilizing the pistilate flower of other varieties of the same cross, as well as varieties of *Ilex*×*merserveae* and some other forms of Ilex,

(c) the ability to be sheared and trimmed to be kept within prescribed limits or shaped to a particular form,

(d) cold tolerance which is superior to the species *Ilex cornuta* as well as most cultivars of that species, as evidenced by the fact that the present variety has survived with no visible damage temperatures of −15° F., whereas the species *Ilex cornuta* and most of its cultivars are listed as hardy to 0° F.,

(e) good heat tolerance which is characteristic of *Ilex cornuta* and which is much improved over *Ilex rugosa,* and,

(f) green, semi-glossy foliage which is less quadrangular in shape as well as less glossy in appearance than *Ilex cornuta.*

4,804

ILEX PLANT—MESAN VARIETY

Kathleen K. Meserve, St. James, N.Y., assignor to Conard-Pyle Company, West Grove, Pa.

Filed Jun. 26, 1980, Ser. No. 163,273
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—65 1 Claim

1. A new and distinct variety of *Ilex*×*meserveae*, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of:

(a) a well branched and upright habit of growth which is more vigorous than that of Blue Prince variety (U.S. Plant Pat. No. 3,517) and which is much more vigorous and more upright than Blue Boy variety (U.S. Plant Pat. No. 2,435),

(b) a more compact and shrub-like habit of growth than *Ilex aquifolium*,

(c) an abundance of staminate flowers which appear in spring, and, in lesser quantities, throughout the entire growing season and which produce the pollen necessary for fertilizing the pistilate flowers of other varieties of *Ilex*×*meserveae* and other forms of Ilex,

(d) the ability to be sheared and trimmed to be kept within prescribed limits or shaped to a particular shape or form,

(e) cold tolerance which is superior to its *aquifolium* parent,

(f) deep, slightly glaucous, green foliage which is longer and wider than that of Blue Prince variety and considerably longer and wider than that of Blue Boy variety,

(g) less prominent spines than Blue Prince variety or Blue Boy variety, which, combined with the vigorous upright habit of growth, make the present variety especially well suited for use as snag-free hedging by walkways and other places where there is considerable traffic, and,

(h) growth characteristics which make it superior in field production from a cultural standpoint to other male *Ilex*×*meserveae*.

4,805

CROSSANDRA INFUNDIBULIFORMIS 'DIANE'

Brian T. Stokes, Rte. 2, Box 11C, Vass, N.C. 28394

Filed Apr. 18, 1980, Ser. No. 142,575
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of *Crossandra infundibuliformis*, substantially as described and illustrated, known by the cultivar name "Diane" and particularly characterized as having large and ovately-oblong shaped leaves, a robust habit of growth, and flowers having larger, more rounded petals and a color which is a darker, richer shade of salmon orange than found in the commonly cultivated variety.

4,806

KALANCHOE NAMED WARRIOR

Claudio Hope, Cartago, Costa Rica, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed May 16, 1980, Ser. No. 150,592
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinctive kalanchoe cultivar, substantially as herein shown and described, characterized by its massed panicels of small flowers of dark red color, its strong, vigorous growth habit, profuse production of flowers, and its year-around flowering ability under photoperiod control.

4,807

CHRYSANTHEMUM NAMED HAWKEYE

Leonard H. Shoesmith, Westfield-Woking, England, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Jul. 18, 1980, Ser. No. 170,074
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—74 1 Claim

1. A fall garden chrysanthemum cultivar, substantially as herein shown and described, characterized in uniqueness, when compared with the variety "Yellow Jacket", by its more vigorous growth which forms a larger mound of bright yellow daisy-like flowers, and by its capability of being grown as a year-round four inch pot plant.

4,808

POINSETTIA NAMED V-14 PINK

Paul Ecke, Jr., Encinitas, Calif., assignor to Paul Ecke Ranch, Encinitas, Calif.

Filed Sep. 5, 1980, Ser. No. 185,121
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—86 1 Claim

1. A new and distinctive poinsettia plant, substantially as herein shown and described, distinguished by the unique pink color of its numerous bracts, which are tightly centered and in overlapping relation to provide a full, compact appearance in full bloom.

4,809

POINSETTIA NAMED V-10 WHITE

Paul Ecke, Jr., Encinitas, Calif., assignor to Paul Ecke Ranch, Encinitas, Calif.

Filed Sep. 5, 1980, Ser. No. 185,124
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—86 1 Claim

1. The new and distinctive poinsettia cultivar, substantially as herein shown and described, characterized by the white coloration of its tight mass of bracts appearing over an abundant display of dark green foilage and by its retention of the important distinguishing characteristics of its grandparent GUTBIER'S V-10.

4,810

POINSETTIA NAMED V-10 MARBLE

Paul Ecke, Jr., Encinitas, Calif., assignor to Paul Ecke Ranch, Encinitas, Calif.

Filed Sep. 5, 1980, Ser. No. 185,125
Int. Cl.[3] A01H 5/00
U.S. Cl. Plt.—86 1 Claim

1. The new and distinctive poinsettia cultivar, substantially as herein shown and described, characterized by the pink and white coloration of its tightly centered and overlapping bracts appearing on a plant otherwise substantially identical with the variety GUTBIER'S V-10 (U.S. Plant Pat. No. 4,235).

PATENTS

GRANTED JAN. 19, 1982

ERRATA

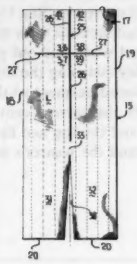
For CLASS	See PATENT NO.
434–042	4,310,974
277–206	4,311,248
294–141	4,311,262
073–864	4,311,484
501–032	4,311,529
376–249	4,311,556
376–271	4,311,557
376–296	4,311,558
376–432	4,311,559
376–225	4,311,560
264–040	4,311,632
376–109	4,311,912

PATENTS

GRANTED JANUARY 19, 1982

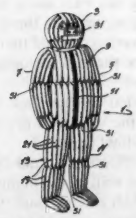
GENERAL AND MECHANICAL

4,310,925
GARMENT
Alen S. York, New York, N.Y., and Judd M. York, Clover, S.C., assignors to Countess York, Ltd., Kings Mountain, N.C.
Filed Oct. 31, 1978, Ser. No. 956,365
Int. Cl.[3] D05B *97/00*; A41D *1/00*
U.S. Cl. 2—69.5 **18 Claims**



1. A garment comprising a generally tubular body having a front and a back, said front having an uppermost free edge, a generally cross-shaped slit disposed symmetrically relative to said front, said cross-shaped slit being defined by a leg disposed in generally transverse relationship to and opening through said uppermost free edge and an arm disposed generally transverse to said leg and in spaced relationship to said uppermost free edge, said cross-shaped slit defining first, second, third and fourth inboard corners of said front, said leg and uppermost free edge defining fifth and sixth inboard corner of said front disposed on the same side of said arm as said first and third corners, respectively, first means for securing said first and second corner to each other, second means for securing said third and fourth corner to each other, third means for securing said fifth corner to said front at a point remote from said second corner, and fourth means for securing said sixth corner to said front at a point remote from said fourth corner thereby forming a shoulder portion and arm openings in said body.

4,310,926
FIREPROOF SUIT
Jules Maroist, 1760 boul. Hamel Ouest, Quebec, Que. G1N 3Z2, Canada
Filed Sep. 6, 1979, Ser. No. 72,834
Int. Cl.[3] A41D *11/00*
U.S. Cl. 2—81 **8 Claims**



1. A suit enabling a person while wearing same to walk through high temperature flames and fire, which comprises:

an inner water-impermeable, flexible sheet material shaped to cover the entire body of a person,

at least one outer water-permeable, flexible sheet material substantially shaped as said inner sheet material,

means to combine said inner sheet material and said at least one outer sheet material to form a multi-ply assembly adapted to be worn by said person and including hood or bonnet, arms, trunk and leg portions,

said assembly having means including an inlet to continuously introduce water under pressure into said multi-ply assembly between said inner water-impermeable, flexible sheet material and said at least one outer water-permeable sheet material, and means including an outlet to enable said water to continuously exit from between said inner water-impermeable, flexible sheet material and said at least one outer water-impermeable sheet material after having circulated therebetween,

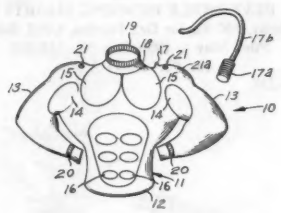
said inner water-impermeable, flexible sheet material and said outer water-permeable, flexible sheet material being longitudinally sewn together so as to form continuous vertical tubular channels covering the entire surface of said multi-ply assembly, so as to enable said water to continuously circulate therethrough from said inlet to said outlet,

said tubular channels being substantially reduced in cross section opposite main body articulations to form joints;

a viewing window formed in said hood or bonnet portion, and

an opening in said assembly to permit said person to put on said suit.

4,310,927
MUSCLE MAN SHIRT
Alfred C. DeBose, 7835 Grow La., #1013, Houston, Tex. 77040
Filed May 30, 1980, Ser. No. 156,065
Int. Cl.[3] A41B *1/00*
U.S. Cl. 2—115 **2 Claims**



1. A muscle enlarging shirt, comprising, in combination, a hollow main body, a circular tail portion for fitting a child's waist, a pair of arm portions secured to said hollow main body, a pair of inflatable bicep portions, a pair of chest portions, a plurality of stomach portions secured to said hollow main body, and a cape removably secured to said hollow main body; said pair of inflatable chest portions being adjacent to each other, and fixedly secured to said hollow main body, below a neck portion thereof, and a flexible band is fixedly secured to the top of said neck portion, for securing said shirt to a child's body, when inflation takes place, and said pair of arm portions are fixedly secured to shoulder portions of said hollow main body, said pair of inflatable bicep portions are each fixedly secured to one of said arm portions, said pair of arm portions each including an elastic wrist band for further aiding in securement of said shirt to said child's body, when inflation takes place, and a single valve is fixedly secured to one of said shoulder portions, for receiving either air, gas or fluid.

4,310,928
SURGEON'S GLOVE AND TALC FREE PROCESS FOR FORMING SAME

John J. Joung, South Pasadena, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Jul. 30, 1979, Ser. No. 61,790
Int. Cl.[3] A41D *19/04*
U.S. Cl. 2—161 R 10 Claims

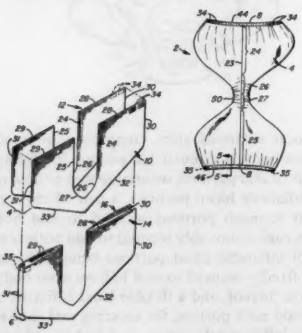
1. A surgeon's glove comprising a highly stretchable latex shell that is free of powder of mineral origin, wherein the glove has a lipo compound carried on its surface and a surfactant for the lipo compound on its surface, whereby the glove is strippable from a form.

9. A surgeon's glove which has a lipo compound carried on its surface and a surfactant for the lipo compound on its surface, whereby the glove is strippable from a form.

4,310,929
REVERSIBLE RUNNING SHORTS

Susan L. Finlay, 107 Taylor Dr., Fairfax, Calif. 94930

Filed May 1, 1980, Ser. No. 145,518
Int. Cl.[3] A41D *1/08*
U.S. Cl. 2—238 14 Claims



1. A reversible pair of shorts particularly suited for use by runners or joggers comprising:

a first hourglass-shaped cloth panel having at least one finished surface;

a second hourglass-shaped cloth panel having at least one finished surface;

a second hourglass-shaped cloth panel having at least one finished side and of substantially identical size as said first panel;

said first and second panels joined along their corresponding edges with finished surfaces exposed to form an hourglass shaped wrap-aroundd garment;

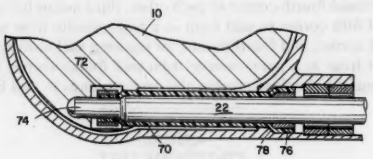
each said first and second cloth panels further comprising first and second generally horseshoe-shaped sections, said sections having opposed wide extensions and a narrow connecting segment, said extensions and connecting segment defining an elongate U-shaped internal edge within each section, said first section being a generally mirror image of said section, said first and second sections being bound along their corresponding U-shaped internal edges, whereby the bound sections form the generally hourglass-shaped cloth panel when laid out on a flat surface; and

means for detachably fastening the top and bottom edges of said hourglass-shaped garment so that a wearer can wear said garment with the narrow central portion within the wearer's crotch and the top and bottom edges encircling and fastened around the wearer's waist.

4,310,930
RIGID-VANE ARTIFICAL HEART

Michael P. Goldowsky, Valhalla, N.Y., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 28, 1979, Ser. No. 97,998
Int. Cl.[3] A61F *1/00*
U.S. Cl. 3—1.7 15 Claims



1. An artificial heart pump comprising:

a rigid housing having walls defining a pumping chamber with at least one intake port and one outlet port;

a vane shaft, having two ends and a longitudinal axis therethrough, pivotally mounted in the housing about its longitudinal axis, and having one end thereof extending into the pumping chamber through an opening in a wall of the pumping chamber;

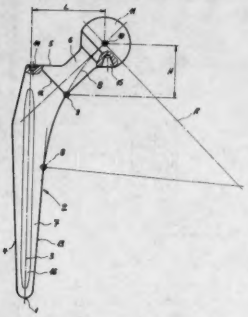
a rigid vane, mounted on the vane shaft in the pumping chamber so that the vane will pivot with the vane shaft about the longitudinal axis; and

a torsion seal, for effecting a fluid-tight seal between the vane shaft and the wall of the pumping chamber through which the vane shaft extends, said torsion seal comprising a tube-shaped resilient material having two ends and being mounted substantially coaxially around the vane shaft, one end of said tube being sealed fluid-tight to the vane shaft and the other end being sealed fluid-tight to the wall of the pumping chamber through which the vane shaft extends, thereby hermetically sealing the pumping chamber.

4,310,931
HIP JOINT PROSTHESIS

Maurice E. Müller, Bern, Switzerland, assignor to Gebruder Sulzer A.G., Winterthur and Protek A.G., Bern, both of, Switzerland

Filed Sep. 29, 1980, Ser. No. 191,413
Claims priority, application Switzerland, Oct. 11, 1979, 9217/79
Int. Cl.³ A61F *1/24*
U.S. Cl. 3—1.913 4 Claims



1. A hip joint prosthesis comprising

a shank for anchoring in a cement bed in a surgically prepared femur, said shank having a narrow blade-like portion formed with a narrow lateral side and a narrow medial side, and extending along a longitudinal median axis from a distal end with a conical taper symmetrically of said axis, a beveled side extending from a discontinuity on said lateral side at an angle inwardly toward said axis and an arcuate side extending from a transition point on said medial side on a radius of a circle;

a neck angularly disposed relative to said axis of said shank and having a lower edge connected to said arcuate side of said shank at a predetermined point;

a shoulder between said shank and said neck and extending from said predetermined point; and

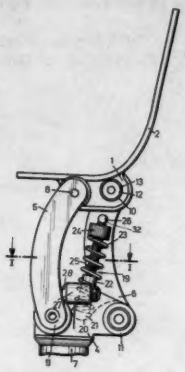
a joint head on said neck having a center point disposed on an arc passing through said transition point, said predetermined point and said center point and having a radius equal to said radius of said arcuate side.

4,310,932
ARTIFICIAL KNEE-JOINT

Max Näder, Hindenburgring 39, 3428 Duderstadt, and Richard Glabiszewski, Im Puttfeld 1, 3428 Duderstadt 13, both of Fed. Rep. of Germany

Filed Sep. 26, 1979, Ser. No. 78,934
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1978, 2841999
Int. Cl.³ A61F *1/08*
U.S. Cl. 3—28 23 Claims

1. An artificial knee joint for an artificial leg, comprising an upper joint part including an anterior pivoting joint and a posterior pivoting joint spaced from each other; a lower joint part also including an anterior pivoting joint and a posterior pivoting joint spaced from one another; a pivotable anterior connecting bar interconnected between the anterior pivoting joint of said upper part and the anterior pivoting joint of said lower part; and a pivotable posterior connecting bar interconnected between the posterior pivoting joint of said upper part and the posterior pivoting joint of said lower part, the imaginary connecting line extending between the anterior pivoting joint of said lower part and the posterior pivoting joint of said lower part being substantially horizontal when the leg is in a vertical position, and the imaginary connecting line extending between the anterior pivoting joint of said upper part and the anterior pivoting joint of said lower part being inclined at a relatively small angle relative to the imaginary connecting line

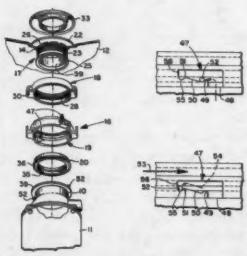


extending between the posterior pivoting joint of said upper part and the posterior pivoting joint of said lower part.

4,310,933
FOOD WASTE DISPOSER MOUNTING ASSEMBLY

Jerome F. Stratman, Cypress, Calif., assignor to Tappan Company, Mansfield, Ohio

Filed Jul. 6, 1979, Ser. No. 55,155
Int. Cl.³ A47K *1/14;* E03C *1/26*
U.S. Cl. 4—286 15 Claims

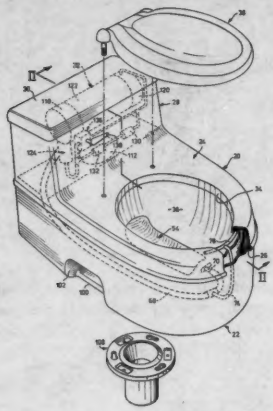


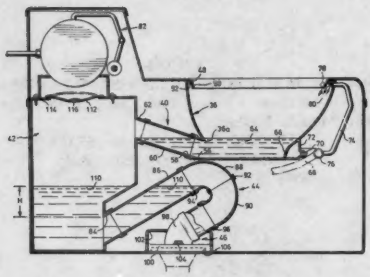
1. In combination with a food waste disposer having an upper hopper flange, a mounting assembly for suspending the disposer below and in communication with a drain opening in a sink, comprising a sink flange having a tubular portion received in and extending below the drain opening, means for nonrotatably securing said sink flange to the sink, an annular elastomeric cushion mount resiliently secured to said tubular portion of said sink flange beneath the sink, and mounting means rotatably carried on and substantially closely encircling said elastomeric cushion mount to clampingly urge the hopper flange to and against said cushion mount, said mounting means thereby compressing the substantially encircled cushion mount to provide a tight seal between the tubular portion of the sink flange and the hopper flange.

4,310,934
WATER-CONSERVING TOILET

Arnold Hennessy, 182 Niles St., Wellington, Ontario, Canada (K0K 3L0), and John D. Inch, Box 118, Lansdown, Ontario, Canada

Filed Nov. 1, 1979, Ser. No. 90,370
Int. Cl.[3] E03D *1/00, 1/08, 3/10*
U.S. Cl. 4—321 14 Claims



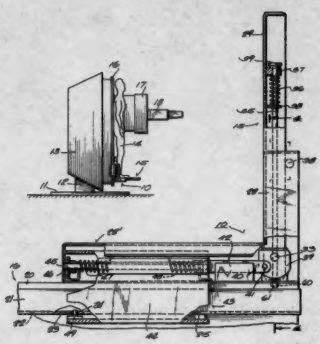


1. A toilet which includes:
a bowl for receiving waste;
a waste outlet extending laterally from the bowl and defining a first, shallow trap arranged so that a relatively shallow body of liquid is normally retained in the bowl for preventing gaseous communication through the trap;
a flush system arranged, when operated, to deliver a charge of flushing liquid into the bowl in a direction to cause said body of liquid and waste to be discharged through said outlet;
a waste holding tank communicating with said bowl outlet for receiving waste from said bowl;
a holding tank outlet extending outwardly from said tank and adapted for connection to a sewer inlet, said holding tank outlet defining a second trap of substantial height capable of preventing reverse flow of sewer gas into the holding tank in use;
the holding tank and second trap being arranged to contain a volume of liquid substantially in excess of that discharged from the bowl at each flush; and,
a flexible diaphragm extending across the holding tank above the level at which liquid enters from the bowl and sealed to the tank in gas-tight fashion, said diaphragm being adapted to flex upwardly and accommodate air displaced as liquid enters the tank from the bowl, so as to minimize air resistance to flushing of liquid from the bowl.

4,310,935
FOOTREST FOR AN X-RAY TABLE

Edward P. Stevens, Broomfield, and Jack H. Zabel, Milwaukee, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed May 8, 1980, Ser. No. 147,777
Int. Cl.[3] A47C *20/02;* A61G *7/06*
U.S. Cl. 5—80 3 Claims



1. A footrest assembly for an x-ray table top structure which has a longitudinally extending series of spaced apart position holding means at each of its laterally spaced apart sides for enabling said assembly to be engaged with said table top structure at selected longitudinal positions, said footrest assembly comprising:
a support member for extending laterally across said table top,
a footrest platform pivotally mounted to said support member for being rotated between attitudes of nominal parallelism and nominal perpendicularity with respect to said table top,
movable stop members and means for operatively coupling said stop members to said platform such that when movement of said members is interfered with said platform cannot be rotated out of its nominally parallel attitude,
manually operable latch means mounted, respectively, at laterally opposite sides of said support member, each latch means including a first element for releasably engaging with a selected position holding means and a second element which is disposed in non-interfering relationship with respect to said stop member in response to said first element being engaged with a holding means and which is urged into interfering relationship with respect to said stop member in response to said first element not being engaged with a holding means to thereby prevent rotation of said platform from its nominally parallel attitude.

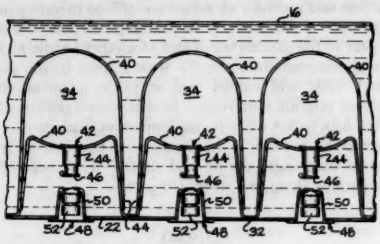
4,310,936
WATER MATTRESS WITH INTERNAL DAMPING MEANS

Gary L. Benjamin, Mount Blanchard, Ohio, assignor to Kuss Corporation, Findlay, Ohio

Continuation-in-part of Ser. No. 894,105, Apr. 6, 1978, Pat. No. 4,168,555. This application Jul. 30, 1979, Ser. No. 61,752
Int. Cl.[3] A47C *27/08*
U.S. Cl. 5—450 8 Claims

1. A water mattress comprising a pliable liquid impervious envelope having an upper and a lower panel, a plurality of chamber defining means disposed within said envelope for damping water motion, said chamber defining means including

a plurality of chamber panels having two opposed, coextensive surfaces, a first portion of one of said surfaces of at least one of said panels defining an inner surface of one of said chambers



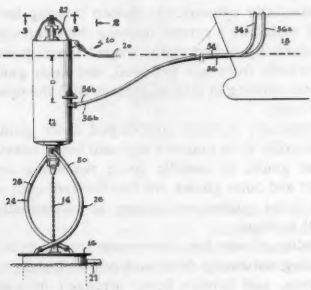
and a second portion of said one of said surfaces defining an outer surface of an adjacent one of said chambers and means for filling said chambers with a gas.

4,310,937

MOORING TERMINAL WITH TOP MOUNTED FLUID SWIVEL

Robert D. Karl, Pacific Palisades; James M. Kentosh, and John Vitale, both of Los Angeles, all of Calif., assignors to Amtel, Inc., Providence, R.I.

Filed Aug. 30, 1979, Ser. No. 71,272
Int. Cl.³ B63B *21/52*
U.S. Cl. 9—8 P **9 Claims**



4. A fluid swivel assembly for use in a mooring and cargo transfer system of the type which includes a buoy anchored to the sea floor and a fluid conduit means extending from the sea floor and through the fluid swivel for connection to a vessel, comprising:

a fluid swivel having a stationary portion and a rotatable portion which is rotatable without limit about a vertical axis;

a pair of fluid conduits extending in opposite directions from said fluid swivel, each conduit including an expandable section that permits the conduit to expand and contract in length; and

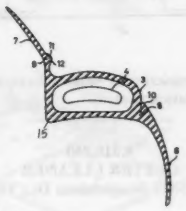
tying means connecting together locations on said pair of fluid conduits lying beyond the ends of said expandable sections, which are furthest from said fluid swivel, said tying means being free to move relative to said fluid swivel to support each conduit on the other against excessive deflection away from the axis of rotation of the fluid swivel.

4,310,938

SWIMMING SHOE FOR BREAST STROKE

Dieter Eichler, Wessobrunner Str. 25, 8000 Munich 70, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 881,700, Feb. 27, 1978, abandoned. This application Dec. 6, 1979, Ser. No. 100,944
Int. Cl.³ A63B *31/10*
U.S. Cl. 9—309 **9 Claims**



1. A breast stroke swimming shoe, comprising a shoe body including upper wall means, bottom wall means forming sole means, inner side wall means, and outer side wall means, said wall means being operatively interconnected to form a foot receiving cavity, first outer propulsion flap means (**6**), first hinge means (**8**) operatively securing said first outer propulsion flap means (**6**) to said bottom wall means substantially alongside said outer side wall means for permitting the folding of said first outer propulsion flap means inwardly toward said sole means in response to a pull portion of a breast stroke, second inner propulsion flap means (**7**), and second hinge means (**9**) operatively securing said second inner propulsion flap means to said inner side wall means substantially alongside said upper wall means for permitting the folding of said second inner propulsion flap means downwardly toward said inner side wall means in response to said pull portion of a breast stroke and folding angle limiting means operatively arranged to limit the folding angle of said first and second propulsion flap means for permitting the simultaneous unfolding of both propulsion flap means into a propulsion effective plane in response to a push portion of a breast stroke, said folding angle limiting means being positioned for defining the fully unfolded position of said first and second propulsion flap means in which said flap means extend substantially at right angles to the direction of a breast stroke propulsion force vector exerted by the push portion of the breast stroke and wherein said outer propulsion flap means (**6**) extends in its rest position approximately in parallel to said sole means and in its work position approximately at a right angle to said sole means and downwardly from said sole means.

4,310,939

METHOD OF PRODUCING SEMICIRCULAR WASHERS HAVING A PROJECTION TO PREVENT ROTATION

Yoshio Iijima, Nagoya, Japan, assignor to Daido Metal Company Ltd., Japan

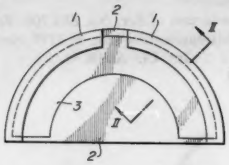
Filed Oct. 5, 1979, Ser. No. 82,184
Claims priority, application Japan, Oct. 6, 1978, 53-123934
Int. Cl.³ B21D *53/20*
U.S. Cl. 10—86 B **3 Claims**

1. A method for producing semicircular washers having a projection for preventing rotation, comprising the steps of:

forcing a flat bar blank to pass through a confined or closed roll caliber defined between an upper and lower forming rolls arranged in a pair to form said flat bar blank to be bent on and along one of said forming rolls while being compressed in the breadthwise direction to produce a semicircular washer, wherein said flat bar blank has been prepared to have a width larger than that of said roll caliber; and

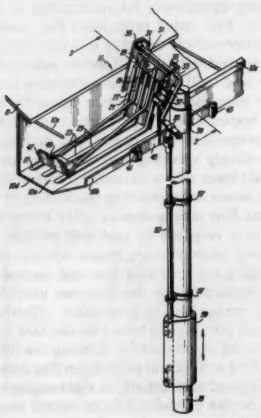
punching out the outer marginal portion of said semicircular

washer to using shearing tools to form the projection for preventing rotation on said semicircular washer, thereby



to provide a semicircular washer having a projection for preventing rotation thereof.

4,310,940
GUTTER CLEANER
Edward L. Moore, 5517 Susquehanna Dr., Virginia Beach, Va. 23462
Filed Oct. 1, 1979, Ser. No. 80,718
Int. Cl.³ E04D *13/06*
U.S. Cl. 15—105 **6 Claims**



1. Apparatus for remotely cleaning an overhead gutter, said apparatus comprising:

elongated handle means, said handle means having an top end and an bottom end adapted to be held by an operator;

first fork means rigidly attached to said top end of said handle means, and including a first portion substantially vertical with respect to the ground when said elongated handle means is held substantially vertically with respect to the ground; and, wherein said first portion of said first fork means and said elongated handle means intersect at a first acute angle in a substantially vertical plane containing said first portion of a first fork means and said elongated handle wherein said first fork means is adapted for insertion into said gutter and under a overhang thereover for slidable movement along the interior of said gutter;

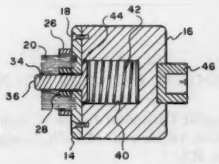
second fork means pivotally attached to said top end of said handle means, said second fork means adapted for rotational motion with respect to said first fork means in order to selectively engage debris positioned between said first and second fork means as a result of the slidable movement of said apparatus;

control means operable from said bottom end of said handle for selectively rotating said second fork means and for imparting slidable movement to said apparatus along said overhead gutter;

wherein said first fork means includes a second portion integral with said first portion, said second portion being substantially horizontal with respect to the ground when said elongated handle means is held substantially vertically with respect to the ground; and,

wherein said second fork means has affixed thereto a pusher member which extends substantially vertically with respect to the ground when said elongated handle means is held substantially vertically with respect to the ground and while said second fork means is in an essentially closed position with respect to said second portion of said first fork means whereby said apparatus is adapted to push debris from under gutter retainers when said apparatus slides thereunder during said slidable movement of said apparatus along said overhead gutter.

4,310,941
CABLE AND BATTERY TERMINAL CLEANER
James J. Smith, 421 Sixth Ave., Lindenwold, N.J. 08021
Filed Mar. 17, 1980, Ser. No. 130,829
Int. Cl.³ A46B *9/08, 13/08*
U.S. Cl. 15—160 **2 Claims**



1. A cable and battery terminal cleaner for cleaning the plane annular surfaces of side battery post and cable terminals comprising:

a substantially cylindrically shaped housing having an end wall including a central opening there through;

a substantially cylindrically shaped inner guide extending outwardly from said end wall, said inner guide having a center opening in axial alignment with the opening in said end wall;

a substantially cylindrically shaped outer guide extending outwardly from said end wall and being coaxial with said inner guide, an annular space remaining between said inner and outer guides, the free forward ends of said inner and outer guides terminating at substantially the same axial location;

a plurality of wire bristles secured to said housing and extending outwardly from said end wall and perpendicular thereto, said bristles being arranged in a substantially annular configuration within said annular space;

an axially movable pilot pin extending outwardly from said end wall in the same direction as said bristles and through said openings;

means biasing said pilot pin forwardly so that it extends a distance beyond the free ends of said bristles;

said pilot pin being movable toward the interior of said housing, the free end of said pilot pin lying inwardly of the free end of said inner guide when said pilot pin is moved fully toward the interior of said housing.

4,310,942
CHIMNEY CLEANING APPARATUS
Harry Krape, 409 Horton St., Wilkes Barre, Pa. 18702
Filed Oct. 6, 1980, Ser. No. 193,963
Int. Cl.³ A46B *13/08*
U.S. Cl. 15—162 **7 Claims**

1. An apparatus for cleaning a chimney flue comprising:

a. a resilient, compressible brush member of a size accomodatingly larger than the chimney to be cleaned;

b. a first body plate having a centrally located aperture therein;

c. means for releasably connecting said brush member to said first body plate whereby said brush member is located at a higher elevation in the chimney to be cleaned than said first body plate;

d. a second body plate having a centrally located aperture therein;

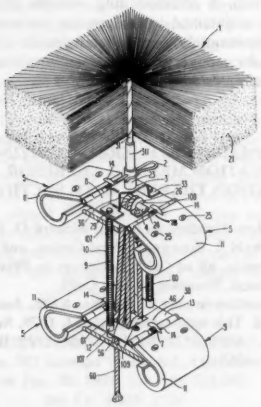
e. a first pulley rotationally mounted to said first body plate in a position spanning the aperture therein;

f. a second pulley rotationally mounted to said second body plate in a position spanning the aperture therein;

g. means for slidingly fastening said first body plate to said second body plate in a horizontal plane at a higher elevation in the chimney to be cleaned than the second body plate, whereby said body plates can be drawn together by said pulleys while maintaining the same alignment with respect to each other;

h. means for activating said pulleys whereby said first and second body plates are drawn together;

i. a plurality of springs interposed between said first and second body plates, said springs compressed as said body plates are drawn together and relaxed as said body plates move apart whereby the movement of the body plates toward each other is resisted;



j. at least about two outwardly projecting legs retractably mounted on said first body plate, said legs spanning the width of the chimney to be cleaned when extended, whereby the apparatus is maintained in a fixed position in said chimney;

k. at least about two outwardly projecting legs retractably mounted on said second body plate, said legs spanning the width of the chimney to be cleaned when extended, whereby the apparatus is maintained in a fixed position in said chimney;

l. means for extending said legs on said first body plate in an outward and upward direction in said chimney whereby a downward movement of the first body plate is resisted;

m. means for extending said legs on said second body plate in an outward and upward direction in said chimney whereby a downward movement of the second body plate is resisted;

n. means for retracting said first body plate legs whereby said first body plate can move in an upward motion;

o. means for retracting said second body plate legs whereby said second body plate can move in an upward motion;

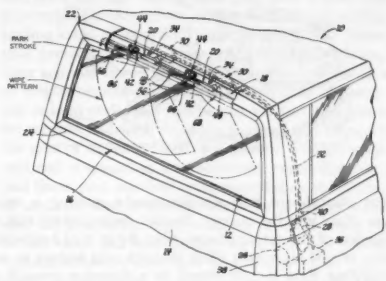
whereby said apparatus moves in an upward motion in said chimney by upward motion of said first body plate due to upward force of said springs (i) followed by upward motion of said second body plate by activation of said pulleys thereby causing an upward step-wise motion of the entire apparatus of the invention resulting in a brushing of the entire length of the chimney to be cleaned.

4,310,943

VEHICLE WINDOW CLEANING SYSTEM

Victor J. Palma, Canton Township, Madison County, Mich., assignor to American Motors Corporation-Jeep, Southfield, Mich.

Filed Apr. 28, 1980, Ser. No. 144,133
Int. Cl.³ B60S 1/46
U.S. Cl. 15—250.01 **10 Claims**



1. A vehicle window cleaning system for a vehicle having a drop glass window of the type in which a pane of glass is movable between an open position and a closed position, the vehicle including a header portion adapted to receive a marginal edge of the glass pane, the system comprising:

wiper means mounted on the vehicle and movable from a park position through a range of travel over the glass window to define a wipe pattern for wiping the glass window free of matter deposited on the glass window within the wipe pattern;

drive means mounted on the vehicle for providing a source of controlled drive power to move the wiper means; and

guide means mounted on the vehicle for guiding the wiper means along a guide path between the park position and an inward limit position of the wipe pattern, said guide means including a cam guide spaced upwardly and outwardly from the marginal edge of the glass pane in the closed position of the pane of glass and configured to define the guide path, said wiper means including at least one wiper arm pivotable about a pivot axis on the header portion and a wiper blade assembly secured to the wiper arm, said wiper arm including a segment offset upwardly and outwardly away from the wiper blade assembly, said offset segment defining a cam follower adapted to engage and follow the cam guide between the inward limit position and the park position.

4,310,944

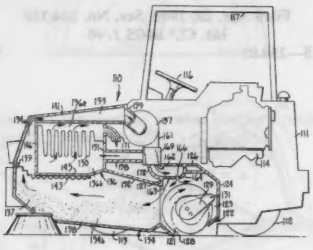
SURFACE MAINTENANCE MACHINE HAVING AIR RECIRCULATION

Harley E. Kroll, Chaska, and Donald L. Thomsen, Minneapolis, both of Minn., assignors to Tennant Company, Minneapolis, Minn.

Division of Ser. No. 873,226, Jan. 30, 1978, Pat. No. 4,206,530.
This application Apr. 7, 1980, Ser. No. 137,572
Int. Cl.³ A47L 11/202
U.S. Cl. 15—346 **10 Claims**

1. A surface cleaning machine having a normally longitudinally forward direction of movement, said machine comprising a frame, a plurality of surface engaging wheels suitable for supporting said frame, a debris pickup housing supported by the frame, said housing having a downwardly facing opening and a debris discharge opening, means for sweeping material from beneath said housing through the debris discharge open-

ing, a hopper supported by the frame, said hopper having a debris inlet opening directly communicating with the housing discharge opening, said hopper having a portion remote from the debris inlet opening, a single blower for withdrawing air from said hopper remote portion and a filter chamber associated with said hopper, said single blower moving one portion of the air through said filter chamber and from thence to the



ambient atmosphere and simultaneously moving a second portion of air into the hopper, thereby recirculating said second portion of air under pressure whereby at least a substantial quantity of said air moves again through said hopper to assist in propelling light weight debris in a direction toward said remote hopper portion thereby facilitating picking up debris and filling of said hopper with debris.

4,310,945

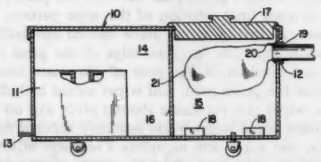
VACUUM EXTRACTION RECOVERY SYSTEM ASSEMBLY

Herbert Tribolet, 2671 Paradise Way, Grand Junction, Colo. 81501

Continuation of Ser. No. 782,137, Mar. 28, 1977, Pat. No. 4,167,800. This application Jun. 11, 1979, Ser. No. 47,409

Int. Cl.[3] **A47L** *9/10*

U.S. Cl. 15—347 **9 Claims**



1. Vacuum extraction recovery system assembly comprising

a compartmentalized vacuum housing having a substantially air tight exterior wall and an interior which is bounded from below by a bottom floor portion and which includes a first lateral interior portion and a second lateral interior portion disposed upwardly of such bottom floor portion,

means for creating a vacuum disposed in the first lateral portion of the interior of the housing,

wall surface means containing a constantly freely open flow aperture therein and defining together with an adjacent portion of the exterior wall of the housing thereat an interior vacuum compartment disposed in the second lateral portion of the interior of the housing and laterally remotely spaced from the means for creating a vacuum disposed in the first lateral portion of the interior of the housing and in constant, and freely open flow communication with the remainder of the interior of the housing through the flow aperture and said interior vacuum compartment is thereby constantly maintained by such freely open flow aperture under vacuum condition corresponding to the vacuum condition in the remainder of the interior of the housing upon creating a vacuum in the housing by the means for creating a vacuum,

a closable access opening in the exterior wall of the housing and directly communicating with the interior vacuum compartment,

removable flow communicating closure insert means for insertion in the access opening for closing off the interior vacuum compartment from the exterior of the housing and for preventing direct flow communication through the access opening between the exterior of the housing and the interior vacuum compartment,

exterior inlet means and interior outlet means contained on the closure insert means and disposed in flow communication with each other through the closure insert means, said inlet means being adapted for flow connection with an external vacuum extraction recovery hose and arranged for flow communicating the exterior of the housing with the flow aperture of the wall surface means through the closure insert means, the outlet means, and interior vacuum compartment, and

spacing support means in the interior of the housing for maintaining the outlet means of the closure insert means in raised open flow relation to the bottom floor portion of the interior of the housing,

whereby upon creating a vacuum by the means for creating a vacuum, a corresponding vacuum condition is constantly maintained in the interior vacuum compartment laterally remotely spaced therefrom and in turn at the inlet means for recovery in the assembly of vacuum extracted material entering through the inlet means.

4,310,946

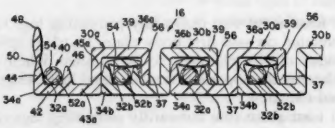
ELECTROMAGNETIC ENERGY-CARRYING TUBE AND FABRICATION METHOD THEREFOR, AND THE COMBINATION THEREOF WITH SUCTION CLEANING APPARATUS

John C. Baker, Huntington Beach; Richard O. Finley, Redondo Beach; David A. Stanwood, West Covina, and Robert C. Bryson, Torrance, all of Calif., assignors to Plastiflex Company International, Fountain Valley, Calif.

Continuation-in-part of Ser. No. 4,695, Jan. 19, 1979, abandoned. This application Mar. 12, 1979, Ser. No. 19,454

Int. Cl.[3] **A47L** *9/24;* **F16L** *11/12, 11/16;* **B29D** *23/12*

U.S. Cl. 15—363 **64 Claims**



1. In a combination of a flexible tube and electromagnetic energy-carrying means in which said tube comprises elongated strip means helically wound into tubular form, the improvement in which:

said strip means includes first and second margins;

said first strip margin comprises means which entirely overlaps and is secured to said second strip margin at adjoining convolutions of said strip means and which has at least partial independent movement with respect to said second strip margin, to form a secured-together margin structure which permits longitudinal flexing of said tube but resists radially-exerted crushing forces thereon; and

said second strip margin comprises a structurally supporting helically extending, fully enclosing walled enclosure acting both as a conduit carrying said electromagnetic energy-carrying means and as an integral component of the secured-together margin structure.

37. A method for fabricating a flexible tube in combination

with electromagnetic energy-carrying means comprising the steps of:

forming elongated strip means with first and second margins thereof forming components of a radially-directed crush-resistant, flexible structure and with at least one open cavity means at the first margin thereof;

inserting the electromagnetic energy-carrying means into the open cavity means;

closing the cavity means; and

helically winding the strip means upon itself and securing the first strip margin to the second strip margin at adjoining convolutions of the strip means to form the crush-resistant, flexible structure.

44. In a combination of a suction hose defined as a tube with electrical conductors, and a cleaning apparatus having an electrically-driven vacuum pump coupled to a power supply and a separate suction head with electrically actuated cleaning brush means, in which said tube is substantially air-tight and flexible and is pneumatically coupled between said vacuum pump and said suction head and in which said electrical conductors electrically couple said cleaning brush means to said power supply, the improvement in said suction hose comprising:

elongated strip means having a pair of margins with flexible and support elements separated by a flexible central segment and helically wound into tubular form,

one of said strip margins enclosing and being secured to an adjacent one of said margins at adjoining convolutions of said strip means to form a secured-together margin structure in which said flexible and support elements are capable of at least partial independent movement and, together with said flexible central segment, permit longitudinal flexing of said tube and in which said support elements resist radially-exerted crushing forces on said tube, and

said adjacent one of said secured-together strip margins, including said support elements, comprising a structurally supporting closed wall enclosure defining helically extending fully enclosed cavity means acting both as a conduit carrying said electrical conductors and as an integral component of said secured-together margin structure.

4,310,947

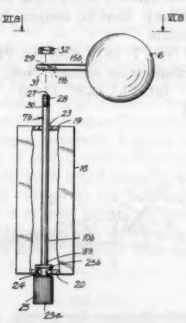
SLIDING DOOR SAFETY DEVICE

Michael Salerno, 392 Ramapo Valley Rd., Oakland, N.J. 07436

Filed Jun. 30, 1980, Ser. No. 164,083

Int. Cl.[3] **E05F** *5/04*

U.S. Cl. 16—83 **5 Claims**



1. A sliding door safety device for a sliding door slidably mounted in a door frame having a track slidably accommodating the door, said door having a leading edge which abuts the frame when the door is closed and a leading surface in the area of the leading edge, said frame having a leading surface which is next-adjacent the leading surface of the door when the door is closed, said sliding door safety device comprising

a resilient ball;

support means pivotally supporting the resilient ball on one of the leading surface of the door and the leading surface of the frame in a manner whereby the gravitational force on said ball moves said ball between the door and the frame, said ball being manually movable away from said door and said frame, so that said ball is positioned by gravitational force in abutment with the leading surface of one of said frame and said door when said door is closed thereby permitting said door to be securely closed with its leading edge in abutment with said frame, and is interposed by gravitational force between said leading edge of said door and said frame when said door is open thereby preventing the door from closing fully by preventing said leading edge of said door from abutting said frame and thus protecting hands from being crushed between said door and said frame, said support means comprising a rod of predetermined diameter having spaced opposite first and second ends, said rod having a linear part extending for most of its length from the first end and being bent in the area of its second end in a manner whereby said second end is spaced at a substantially radial distance from said linear part, said ball being mounted on the second end of said rod, and mounting means for pivotally mounting said rod at an acute angle with one of said leading surface of said door and said leading surface of said frame in a manner whereby said ball is rotatable in an operating plane perpendicular to said linear part and at an acute angle with one of said leading surface of said door and said frame, said mounting means comprising a housing affixed to one of said leading surface of said door and said leading surface of said frame and having spaced substantially parallel top and bottom parts extending in planes spaced below and substantially parallel to the operating plane, said top part having a top hole formed therethrough, said top hole having a diameter sufficiently greater than said predetermined diameter to accommodate said rod loosely, said bottom part having a bottom hole formed therethrough, said top and bottom holes pivotally accommodating said rod with the first end of said rod passing through said bottom hole and the area of the end of said linear part adjacent the bent area of said rod passing through said top hole and most of said linear part of said rod being in said housing and the bent area of said rod being outside of said housing, said rod being severed in its linear part at a point outside said housing and above the top part of said housing; and

rod coupling means at the severed ends of the linear part of said rod for removably joining said severed ends to each other thereby permitting differently bent second end areas of said rod to be coupled to said linear part thereof to enable said sliding door safety device to be mounted at opposite ends and on opposite sides of said door.

4,310,948

HINGE WITH A TELESCOPIC ARM LEVER CLOSING DEVICE

Erich Röck, Höchst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Dec. 17, 1979, Ser. No. 104,465

Claims priority, application Austria, Jan. 2, 1979, 5/79

Int. Cl.[3] **E05D** *11/10, 3/06*

U.S. Cl. 16—335 **9 Claims**

1. A hinge comprising:

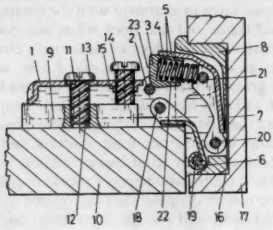
a hinge arm adapted to be mounted on an article of furniture, said hinge arm having fixed thereto first and second hinge axles;

a hinge casing adapted to be mounted on a door of the article of furniture, said hinge casing having fixed thereto third and fourth hinge axles;

a first hinge link pivotally mounted about said first and third hinge axles;

a second hinge link pivotally mounted about said second and fourth hinge axles;

said second hinge link comprising a two-arm lever including a first arm extending between said second and fourth hinge axles and a second arm directed toward said hinge arm;



said second arm comprising a telescopic arm including a movable end member;

spring means mounted in contact with said end member for moving said end member in a direction away from said first arm of said two-arm lever; and

said end member being abutted against a fixed portion of said hinge arm by the force of said spring means.

4,310,949

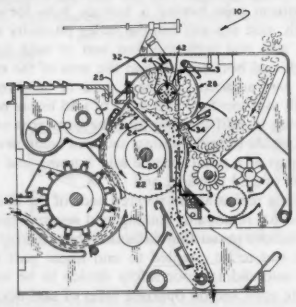
GIN RIB

Arvel L. Vandergriff, 1701 Heffner St., Corcoran, Calif. 93212

Filed Jul. 5, 1979, Ser. No. 54,819

Int. Cl.³ D01B *1/08*

U.S. Cl. 19—62 R **4 Claims**



1. An improved ginning rib for use in a high-capacity gin stand adapted to be mounted between closely related circular saw blades of a ginning saw cylinder, including:

A. a linear body segment having a planar upper surface extended throughout its length;

B. a ginning section comprising a pivotally supported bar of hardened steel having planar surfaces and characterized by a substantially rectangular cross-sectional configuration and a wear durability greater than the wear durability of said linear body; and

C. an angulated tail segment seated on the upper surface of and removably connected to said linear body segment in juxtaposed relation with one end of said bar, said tail segment being characterized by an end surface so positioned relative to said bar as to engage the adjacent end surface of the bar as pivotal motion is imparted thereto for limiting the throw of pivotal displacement imparted to the bar.

4,310,950

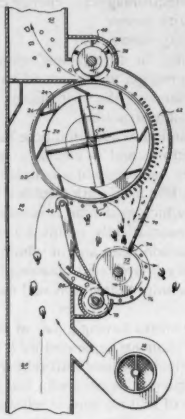
ELEVATOR CLEANER

Donald J. Cox, Box 697, Enochs, Tex. 79324

Filed Jan. 18, 1980, Ser. No. 113,253

Int. Cl.³ D01G *1/00*

U.S. Cl. 19—202 **10 Claims**



1. A cleaner to remove burrs, sticks and trash from seed cotton comprising:

a. an inlet duct terminating at

b. a saw cylinder,

c. a knocker grid adjacent the cylinder to knock burrs, sticks and trash therefrom,

d. a doffer adjacent the cylinder to doff cleaned seed cotton from the cylinder, and

e. saw strips attached to the periphery of the cylinder with spaces between the strips, thus forming air passages between the strips whereby air may flow from the inlet duct through the periphery of the cylinder to within the cylinder and out to the atmosphere, and

f. fan means operatively connected to the cleaner for moving the air as stated above.

4,310,951

LEVER-OPERABLE FASTENER FOR SHOES

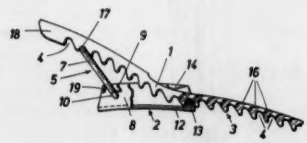
Tilo H. Riedel, Salzburg, Austria, assignor to Sesamat Anstalt, Schaan, Liechtenstein

Filed Nov. 7, 1979, Ser. No. 91,985

Claims priority, application Austria, Nov. 7, 1978, 7943/78

Int. Cl.³ A43C *11/00*

U.S. Cl. 24—68 SK **24 Claims**



1. A lever-operable fastener for a shoe, comprising a first fastener member comprising a tension strap and adapted to be attached to one part of a shoe,

a second fastener member comprising an outwardly open strap retainer adapted to be attached to another part of a shoe and to receive said tension strap in a predetermined orientation,

at least one series of teeth carried by one of said fastener members on the side thereof which faces the other one of

said fastener members in said orientation, said one series of teeth defining tooth spaces which are inclined from a normal on said said strap when said strap has been received by said retainer in said orientation,

a tensioning lever which is connected to said other fastener member and pivotally movable relative thereto in one sense to enter said tooth spaces and engage said one series of teeth and then to tension said strap in its longitudinal direction, and in the opposite sense to disengage said one series of teeth and leave said tooth spaces to release said strap, and

strap-restraining means comprising a first part comprising said series of teeth and a second part comprising a locking pawl carried by said other fastener member and adapted to hold said strap in tension when said strap has been received by said retainer and tensioned and subsequently released by said tensioning lever,

one of said parts of said strap-restraining means being fixed to said retainer and extending toward and being adapted to cooperate with said strap.

4,310,952

BUCKLE WITH READILY RELEASABLE LATCH

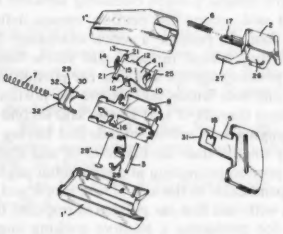
Paul J. Robben, Hasselt, and Hugo R. De Vuyst, Wetteren, both of Belgium, assignors to N. V. Klippan S.A., Haasrode, Belgium

Filed Dec. 4, 1978, Ser. No. 966,414

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1977, 2754389; Oct. 16, 1978, 2844977

Int. Cl.³ A44B *11/25*

U.S. Cl. 24—230 A **16 Claims**



1. Buckle, particularly for safety belts in automotive vehicles, comprising a casing attached by means of a fastening arrangement to an anchoring point on the vehicle, a latch that can be brought into locking engagement with an opening in a tongue, an ejector spring for the tongue and a bias spring for a push button that can be brought into engagement with the latch, characterized by the fact that the latch (4) can pivot on a pivotal axis (13) which is approximately perpendicular to the direction of insertion of the tongue (5) and is fixed in the casing (1), said latch having a generally T-shape with integral ears provided at the top of said T, said ears providing said pivotal axis of said latch, said latch being biased in the unlocked position by the pressure exerted by the bias spring (6), and when said bias spring (6) is at least partially extended, said latch is kept in locking engagement with the tongue (5) by a reinforcing member (3) that moves together with the push button (2).

4,310,953

JEWELRY CLASP

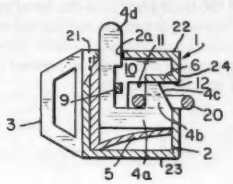
John Nanasi, 35 Jones Rd., Englewood, N.J. 07631

Filed Aug. 8, 1979, Ser. No. 64,854

Int. Cl.³ A44B *19/00*

U.S. Cl. 24—230 AL **2 Claims**

1. A jewelry clasp for releasably securing a jump ring thereto, comprising a housing having top, bottom and side edges, and parallel elongated faces, said top edge having an aperture therein, and an elongated slot means in said faces for receiving a jump-ring, said slot means having a top portion adjacent the top edge of said housing, a bottom portion located between said top portion and said bottom edge of the housing and an opening in one of said side edges; a latching member in said housing having a base portion adjacent said bottom edge, a first leg extending from said base and through said aperture and terminating in a clasp-release actuator outside said housing, and a second leg spaced from said first leg and normally extending from said base across the width of said slot to close said slot opening, said second leg being of a size to fit inside a jump ring and having a cam surface adjacent to and facing said slot opening, said cam surface being inclined away from said slot opening toward said top edge; biasing means urging said latching member to a normal position in which said first leg is out of said housing and said second leg closes said slot; and a stop member is provided extending from said slot opening into



said housing along said top portion of said slot, said second leg terminating in a surface abutting said stop member when said latching member is in said normal position, said stop member and said second leg cooperating to close said slot opening when the latching member is in its normal position; said cam surface being operable, when a jump ring is inserted in said slot and forced against said cam surface, to open said slot by moving said latching member toward said bottom edge against the bias of said biasing means and thus gradually move said surface of said second leg away from said stop member; and said latching member being operable to return to its normal position under the bias of said biasing means when the jump ring has fully entered the slot and no longer contacts said second leg, thereby inserting said second leg into said jump ring; said latching member being further operable, when said actuator is manually depressed against the bias of said biasing means, to open said slot and thus permit removal of said jump ring.

4,310,954

BUCKLE

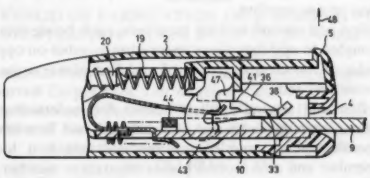
John W. R. Lewis, Sevenoaks, and Mark E. Esner, Wembley, both of England, assignors to Howard Wall Limited, London, England

Filed Nov. 13, 1979, Ser. No. 93,224

Claims priority, application United Kingdom, Nov. 16, 1978, 44722/78

Int. Cl.³ A44B *11/25*

U.S. Cl. 24—230 A **8 Claims**



1. A buckle for holding a plate having an aperture or notch and means by which it can be attached to a vehicle safety belt or harness, said buckle comprising a casing which has a mouth into which can be placed that part of the plate which carries

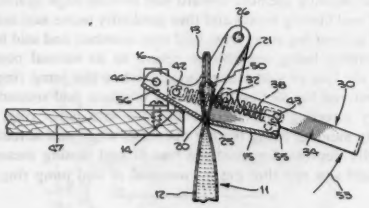
the aperture or notch, a latch plate movably mounted within the casing which includes a tooth to engage said aperture or notch to secure the plate in position, and a projection on the latch plate, the projection having a top and a side, and a release mechanism including a slider which is slidably mounted in the casing and having at least one lever which is operated by the slider and a protrusion having a bottom and a side and mounted on the slider to abut the latch plate projection, the lever operating to swing the latch plate to move the tooth out of the said aperture or notch, the arrangement being such that the slider can slide from a first position with the top of the projection closely adjacent the bottom of the protrusion in which, when the latch plate is in a securing position to retain said plate in position, to a second position with the side of the projection abutting the side of the protrusion in which the plate is moved from the securing position to a release position to release the plate, the arrangement being such that when the slider is in the first position and the latch plate is in the securing position the spacing between the projection top and the protrusion bottom being such that unyielding abutting contact between the projection and the protrusion will occur to prevent the latch plate moving from the securing position.

4,310,955

BLOOD ELEMENT SEPARATION APPARATUS

Henry B. David, 5708 Oakdale Ave., Woodland Hills, Calif. 91367

Filed Dec. 31, 1979, Ser. No. 108,834
Int. Cl.³ B65D *77/10;* A44B *21/00*
U.S. Cl. 24—248 B **8 Claims**



1. A fluid element separation apparatus comprising:

(a) first and second planar separation members, each including a planar surface having a clamping edge thereon, said edges being in parallel relation to each other and are adapted to be placed adjacent one another along the full extent of said clamping edges, said planar separation members being pivotally coupled to one another whereby said clamping edges can be separated in parallel, spaced relation to one another;

(b) first and second locking members, each being rotatably coupled to said first planar separation member on opposite sides of the clamping edge of said first planar separation members; and

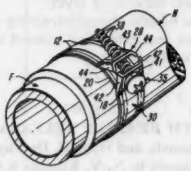
(c) first and second resilient means for maintaining said clamping edges adjacent one another, said first resilient member being coupled intermediate said first locking member and said second planar separation member, said second resilient member being coupled intermediate said second locking member and said second planar separation member whereby the resilient forces imposed by said clamping edges are responsive to the thickness of any object disposed therebetween.

4,310,956

HOSE CLAMP WITH TANGENTIAL SCREW

Alan F. Meckstroth, 2357 Shelterwood Dr., Dayton, Ohio 45409, and James F. Pease, 5805 Folkestone Dr., Dayton, Ohio 45459

Division of Ser. No. 9,455, Feb. 5, 1979, Pat. No. 4,246,690, which is a continuation-in-part of Ser. No. 885,675, Mar. 13, 1978, Pat. No. 4,173,816, which is a division of Ser. No. 703,760, Jul. 9, 1976, Pat. No. 4,078,281, which is a continuation-in-part of Ser. No. 565,545, Apr. 7, 1975, abandoned. This application Jan. 19, 1981, Ser. No. 226,438
The portion of the term of this patent subsequent to Mar. 14, 1995, has been disclaimed.
Int. Cl.³ F16L *33/04;* B65D *63/00*
U.S. Cl. 24—279 **6 Claims**



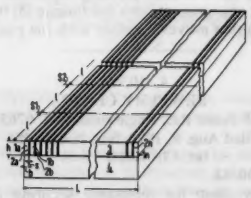
1. An adjustable hose clamp adapted to be produced at a minimum cost, comprising an elongated sheet metal strip having a generally uniform width, said strip having a part-cylindrical band portion intergrally connecting a closely folded first ear portion and a second ear portion, said strip further including an integral tongue portion extending between said first ear portion and said second ear portion, means defining a hole within said first ear portion, a screw extending through said hole and having helical threads, said screw having a head portion for pressing against said first ear portion, means defining at least one hole within said second ear portion for receiving said helical threads of said screw, said second ear portion directly engaging said screw threads and having a thickness substantially smaller than the diameter of said screw, and said second ear portion projecting at a substantial angle relative to a plane perpendicular to the axis of said screw and in converging relation with said first ear portion in response to tightening said screw for producing a positive cocking engagement of said second ear portion with said screw threads and to prevent stripping of said screw through said second ear portion.

4,310,957

METHOD FOR THE MANUFACTURE OF ULTRASONIC HEADS

Bertram Sachs, Erlanger, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 18, 1979, Ser. No. 49,750
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1980, 2829539
Int. Cl.³ H01L *41/22*
U.S. Cl. 29—25.35 **12 Claims**



1. A method for manufacturing ultrasonic heads, particularly transducer combs for ultrasonic arrays or compound

scanners, said method comprising combining a prescribable number of individual transducer elements comprised, in particular, of piezo material, with a prescribable cross-section and a prescribable length by means of an adhesive connection to form a packet with a prescribable shape of the cross-section and a packet length which corresponds to the length of the individual transducer elements and by means of stacking the transducer elements at an interval from one another, for example, on the basis of alternating interposition of spacing strips of a specific thickness or by applying spacing mounts to the individual elements, wherein the improvement comprises the following method steps:

(a) combining a plurality of thin foils (**1***a* through **1***n*; **11***a* through **11***n*) comprised of transducer element material, particularly piezo material, which are matched in their individual cross-sections to the cross-sections of transducer elements but whose lengths, however, amount to a multiple of the length (l) of an individual transducer element of a packet in an adhesive connection to form a foil stack (**3**; **13**) by means of stacking them atop one another at an interval (**2***a* through **2***n*; **12***a* through **12***n*),

(b) cutting off individual packets from the foil stack (**3**; **13**) formed in that manner in cross-cuts (**S1**, **S2**, etc.) which are placed at such intervals (l) from one another along the foil stack as correspond to the overall length of an individual transducer element, and

(c) forming each individual packet into a transducer comb in and of itself,

characterized in that transducer strips (**11***a* through **11***n*) are separated by spacers (**12***a* through **12***n*) and have varying heights joined together in such a manner that a stack (**13**) having a round cross section results.

4,310,958

PRODUCTION-LINE AUTOMATIC MACHINE

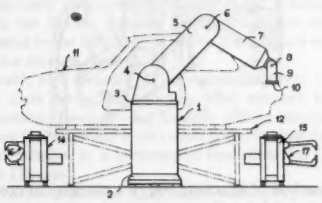
Daniel Balaud, Fontenay Aux Roses; Gaston Keledjian, Boulogne-Billancourt, and Jean R. Passemard, Bailly-Roma Invilliers, all of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Dec. 4, 1978, Ser. No. 965,993

Claims priority, application France, Dec. 7, 1977, 77 36855; May 24, 1978, 78 15445

Int. Cl.[3] **B23K** *9/12;* **B23Q** *3/155*

U.S. Cl. 29—26 A **7 Claims**



1. A production-line robot assembly comprising a robot and an end tool-coupling support intended to be coupled with interchangeable tool assemblies, the end tool-coupling support being responsive to various robot movements during depositing and removal of tool assemblies by the robot, each tool assembly comprising a tool and a bearing plate fast with the tool, said robot assembly comprising a receiving support for each tool assembly, and resilient mounting means for resiliently supporting said receiving support so that the receiving support is axially and laterally movable in response to robot movements during depositing and removal of tool assemblies, said receiving support and said bearing plate of each tool assembly comprising reciprocal centering means for centering the tool assembly on the receiving support in a resting condition of the tool assembly, said end tool-coupling support for tool assemblies and each bearing plate comprising means for causing the mutual centering thereof in a picking-up condition of the tool assembly, said resilient mounting means facilitating approach and centering action between said end tool-coupling support and said bearing plate, and at least one of said end tool-coupling support and bearing plate comprising controlled members adapted to cause their mutual coupling and uncoupling.

4,310,959

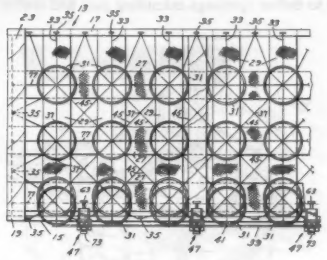
METHOD OF UPHOLSTERING A COUCH AND EDGE WIRE SPRING STABILIZING CLAMP

James C. Wandeloski, 2900 Pontiac Trail, Walled Lake, Mich. 48088

Filed Mar. 17, 1980, Ser. No. 131,070

Int. Cl.[3] **B68G** *7/00, 15/00;* **A47B** *96/06*

U.S. Cl. 29—91.1 **2 Claims**



1. In the method of upholstering a couch or chair having a hollow frame with a front rail, a webbing spanning said frame, a series of longitudinally extending rows of spaced coil springs mounted upon the webbing parallel to said rail and projecting above said frame, and a longitudinal edge wire extending tangent to the top coils of the row of springs adjacent said rail and connected thereto, including the tying of the springs of the other rows together, and to said row of springs adjacent said rail and to said frame;

the preliminary step before said tying of selectively mounting, spacing and securing a plurality of upright edge wire clamps to and along said rail outwardly thereof;

each clamp including an upright support having an edge wire retaining block movably mounted thereon with edge wire retaining means depending therefrom;

selectively adjusting the edge wire retaining blocks on each clamp to a predetermined height with the corresponding edge wire retaining means longitudinally aligned and retaingly engaging said edge wire;

and securing the respective blocks to the corresponding support for locating and stabilizing the row of springs adjacent said rail for maintaining the outer edge of the top coils of said row of springs in a straight line and at a uniform height in order to facilitate the individual tying of the springs of the other rows of the springs together, to said first row of springs and to said frame.

4,310,960

METHOD OF FABRICATION OF A FORMED PLATE, COUNTERFLOW FLUID HEAT EXCHANGER AND APPARATUS THEREOF

Kenneth O. Parker, Rolling Hills Estates, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Continuation of Ser. No. 550,409, Feb. 18, 1975, which is a division of Ser. No. 351,423, Apr. 16, 1973, abandoned. This application May 9, 1978, Ser. No. 904,253

Int. Cl.[3] **B23P** *15/26*

U.S. Cl. 29—157.3 R **5 Claims**

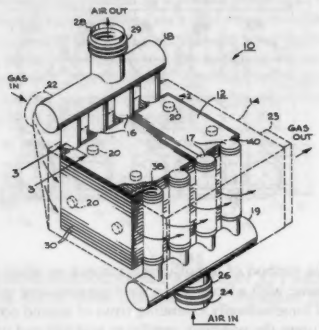
1. The method of fabricating an integral manifold-and-core heat exchanger apparatus composed of stacked plates interspersed with turbulence generating support elements in a central section having first and second fluid passages in adjacent

parallel heat exchanging relationship, the method comprising in a single cycle the steps of:

forming each of a plurality of plates to have (a) and offset flange extending completely about the periphery of the plate and (b) a collar portion surrounding a manifold section opening through said plate in each of respective end sections on opposite ends of a central section;

cleaning the plates and elements to be joined;

stacking said plates by sets in back-to-back relationship in a sandwith configuration with the collar portions of adjacent pairs in abutting relationship with each other (A) to define manifold sections extending through the stacked plates in each said end section on opposite ends of a central section, which manifold sections communicate with associated first passages in adjacent central sections, and (B) to define openings extending past and sealed off from



the manifold sections and communicating between opposite open ends of the stacked configuration via in lieu through associated second passages in adjacent central sections, the first and second passages being in respective alternate layers of the central section for conducting respective fluids in parallel heat exchanging relationship;

during the stacking step, inserting turbulence generating support elements in layers interspersed with said plates, the turbulence generating support elements having surfaces for contacting said plates;

prior to stacking, depositing a brazing alloy on all surfaces which are in contact with each other in the apparatus as assembled;

heating the assembled parts in a controlled atmosphere furnace until all adjacent contacting surfaces are brazed; and

attaching integral fluid ducting to the brazed assembly.

4,310,961

METHOD FOR OPERATING ON CONTINUOUS SLIDE FASTENER CHAIN

Russell A. Clearwater, Delevan, N.Y., assignor to Talon, Inc., Meadville, Pa.

Filed Dec. 31, 1979, Ser. No. 108,321
Int. Cl.³ B23P *11/00*
U.S. Cl. 29—408 **5 Claims**

1. A method of feeding a slide fastener chain and performing an operation on the chain at a work station, comprising the steps of:

passing the chain from a freely rotatable reel through a first loop of variable length around a movable roller,

biasing the movable roller toward a position forming a maximum size of the first loop,

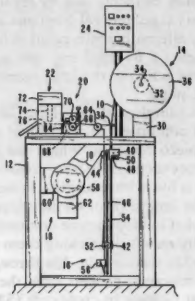
passing the chain from the first loop through a second loop around an engaging surface of a capstan wheel,

intermittently advancing the chain from the second loop to the work station,

rotating the capstan wheel at a speed which advances the engaging surface at a speed faster then the movement of slide fastener chain during the advancing from the second loop,

sensing when the first loop reaches a maximum size,

braking rotation of the reel only in response to sensing of the maximum size of the first loop, and



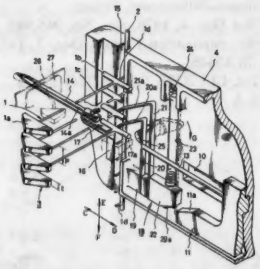
performing an operation on the slide fastener chain at the work station during a dwell period of the intermittent advancing.

4,310,962

METHOD OF AND APPARATUS FOR ATTACHING CONNECTING PIECES

Tadashi Suzuki, Saitama, Japan, assignor to Sato Gosei Co., Ltd., Tokyo, Japan

Filed Jan. 10, 1980, Ser. No. 111,087
Claims priority, application Japan, Sep. 26, 1979, 54-123455
Int. Cl.³ B23P *17/00*; B65C *5/06*
U.S. Cl. 29—417 **5 Claims**



1. In a method of attaching one of a plurality of connecting pieces to an article, each connecting piece having a filament (1*c*), a head portion (1*a*) connected to one end of the filament, a cross-bar portion (1*b*) connected to the other end of the filament, and a connecting portion (1*d*) connected to the cross-bar portion, the plurality of pieces being connected together in parallel relationship to each other to form a belt (3) by having each of the connecting portions be attached to a connecting rod (2) perpendicular to the filaments,

which method comprises the successive steps of:

feeding, the belt downwardly (F) through an opening in a main body (4) of a device,

inserting a hollow needle (14) which is mounted on the main body into the article,

severing the connecting pieces, one at a time from the belt by driving the cross-bar portion with a driver (13) in a forward direction (C) perpendicular to the direction (F) of belt feed through the hollow needle (14) and into the article, and

removing the hollow needle from the article leaving the severed connecting piece therein;

the improvement which comprises:

moving a connecting piece driving member (21) upwardly in a direction (E) opposite to the direction of belt feed to a position above the cross-bar portion of the next connecting piece in said belt by action of a rod driving member (11), said member having the driver (13) mounted thereon, simultaneously with the driving of the cross-bar portion while

preventing the belt from moving upwardly by holding the belt with a holding member (20), and

feeding the belt downwardly until a cross-bar portion contacts a stopper projection (17) formed at the rear of the needle by returning the connecting piece driving member to its original position upon retraction of the rod driving member (11) and the driver (13).

2. In an attaching device for attaching one of a plurality of connecting pieces (1) to an article, each connecting piece having a filament (1*c*), a head portion (1*a*) connected to one end of the filament, a cross-bar portion (1*b*) connected to the other end of the filament, and a connecting portion (1*d*) connected to the cross-bar portion, the plurality of pieces being connected together in parallel relationship to each other to form a belt (3) by having each of the connecting portions be attached to a connecting rod (2) perpendicular to the filaments, which device comprises:

a main body (4) having a feed groove (15) for the belt formed therein,

a hollow needle (14) mounted on the main body having a rear end and an axis, the rear end being mounted adjacent the feed groove with the axis perpendicular to the feed groove, and

a driver (13) operatively mounted in the main body to sever the connecting pieces one at a time from the belt and drive the cross-bar portion of the severed connecting piece through the needle,

the improvement wherein the device further comprises:

a stopper projection (17) formed at the rear end of the needle,

a holding member (20) mounted in the main body preventing the belt from moving upwardly in the feed groove, the holding member having a forward end portion in the feed groove proximate to the stopper projection,

a connecting-piece driving member (21) disposed in said main body substantially parallel to the holding member (20), the driving member having a forward end portion located in the feed groove above the forward end portion of the driving member,

a movable feed member (22) mounted slidably in a groove in the main body, the movable feed member having the connected piece driving member affixed thereto,

a spring (24) mounted in said main body, biasing the movable feed member in a downwards feed direction (F) for the belt (3), and

a rod driving member (11) in the main body carrying the driver (13) adapted to drive the movable feed member (22) against the force of the spring (24) in the direction (E) opposite the feed direction.

4,310,963

METHOD FOR THE FABRICATION OF AN APPARATUS FOR THE CLOSE FITTING POSITIONING OF WORKPIECES TO BE MACHINED

Rudi Blumle, Schwarzbachstr. 52, 7000 Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 869,525, Jan. 16, 1978, abandoned. This application Apr. 23, 1980, Ser. No. 142,975

Int. Cl.³ B23Q *3/18*

U.S. Cl. 29—460 **3 Claims**

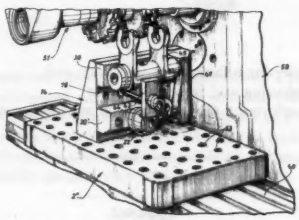
1. A method for the fabrication of an apparatus for the true fitting and highly accurate bearing and detachable fastening of various workpieces to be machined comprising:

(a) boring a plurality of holes in a plate, said holes being arranged in a predetermined coordinate pattern at a predetermined modular distance from each other within a normal (0.3 mm) tolerance of accuracy to form a modular clamping plate;

(b) placing precision holding sockets of a smaller diameter than that of the bore holes into the bore holes which results in appearance of an annular interspace;

(c) aligning the placed precision holding sockets with aid of a high precision master plate having a plurality of socket engaging means arranged precisely in said predetermined coordinate pattern so that said means are at said predetermined modular distance from each other within a highly precise tolerance of accuracy; and

(d) applying an age hardening material into the annular interspace; and



(e) separating the modular clamping plate from the master plate after the age hardening material has hardened;

wherein said boring step further comprises:

drilling a first bore part, and second bore part, and

wherein said placing step comprises inserting in the first bore part the holding fitting sockets with creation of an interspace, and

wherein after said separating step, the method further comprises:

placing a threaded holding socket featuring an inner thread in the second bore hole part, positioning it with respect to the fixed position of the holding fitting socket, and

in the interspace between the holding threaded socket and the second bore hole part applying the age hardening material.

4,310,964

METHOD AND APPARATUS FOR THE AUTOMATED ASSEMBLY OF MAJOR SUBASSEMBLIES

Richard J. Murphy, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 915, Jan. 2, 1979, Pat. No. 4,203,204. This application Nov. 5, 1979, Ser. No. 92,074

Int. Cl.³ B23P *11/00, 21/00*

U.S. Cl. 29—469 **8 Claims**

1. A method of automating the assembly of the components of a major subassembly comprising the steps of:

(a) mounting a major component of a major subassembly in a predetermined position;

(b) securing other components of said major subassembly in predetermined positions related to the predetermined position of said major component;

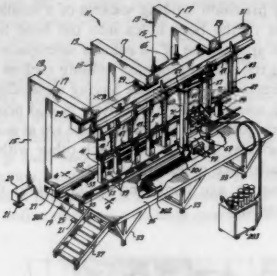
(c) creating alignment holes in said other and major components;

(d) locating still further components with respect to said other and major components using said created alignment holes; and,

(e) permanently fastening said still further, other and major components together by sequentially performing at each

location where a fastener is to be installed in said still further, other and major components the substeps of:

(i) creating a hole,



(ii) inserting a fastener in said hole; and,

(iii) securing said inserted fastener,

prior to performing these substeps at another location.

4,310,965

PROCESS FOR PRODUCING A DIELECTRIC INSULATOR SEPARATED SUBSTRATE

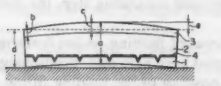
Junichiro Horiuchi, and Hideyuki Yagi, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

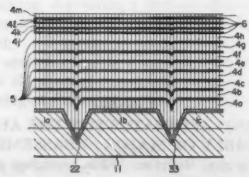
Filed Apr. 10, 1980, Ser. No. 138,992

Claims priority, application Japan, Apr. 13, 1979, 54-44365

Int. Cl.³ H01L *21/304, 21/76*

U.S. Cl. 29—580 **14 Claims**





1. In a process for producing a dielectric insulator separated substrate for semiconductor integrated circuits comprising preparing a composite which comprises a monocrystalline layer and a first polycrystalline film, having at least one polycrystalline layer, superposed through a dielectric film for electrically isolating therebetween, the first polycrystalline film having a thickness sufficient to support island regions to be formed therein, the improvement which comprises forming a lamination of second polycrystalline layers and second dielectric films interposed therebetween on the first polycrystalline film through a third dielectric film, each of said second polycrystalline layers having a thickness that is sufficiently thinner than that of said first polycrystalline film such that deformation of the substrate due to action of oxygen is avoided, and with the thickness of said lamination being capable of covering a machining tolerance for machining of the lamination to produce a flat surface thereon.

4,310,966

METHOD OF MAKING A STATOR FOR LINEAR MOTOR

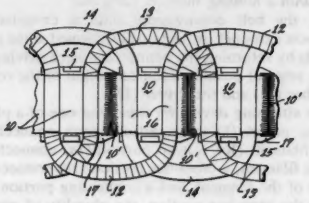
Otto Breitenbach, Nuremberg, Fed. Rep. of Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte AG, Hanover, Fed. Rep. of Germany

Filed Jun. 6, 1979, Ser. No. 45,952

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1978, 2824951

Int. Cl.³ H02K *15/085*

U.S. Cl. 29—596 **1 Claim**



1. Method of making and completing a stator for a linear motor, comprising the steps of

providing a plurality of core elements, each having at least one transverse groove, and arranging these elements in a line transversely to the grooves;

placing a plurality of different, individual cables separately into the grooves in a meandering pattern as to each cable, whereby adjacent ones of the grooves receive a different one of the cables;

retaining the cable in the grooves to provide an elongated assembly comprised of the plural elements held together by the cables;

winding the assembly on a drum and transporting it to the carrier; and

subsequently affixing the elements as so assembled to a carrier.

4,310,967

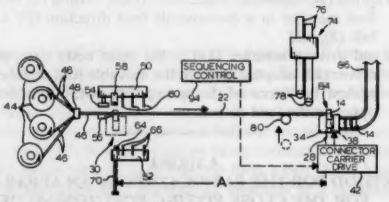
APPARATUS FOR ELECTRICAL HARNESS FABRICATION

Jack F. Funcik, Downers Grove; Joseph C. Bennet, Lisle; Joseph T. Tubbs, Woodridge, and Thomas E. Schneider, Burbank, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Division of Ser. No. 12,715, Feb. 16, 1980, Pat. No. 4,235,015. This application Aug. 11, 1980, Ser. No. 176,543

Int. Cl.³ B23P *19/00*

U.S. Cl. 29—749 **5 Claims**



1. In a machine for making an electrical harness, said harness comprising at least one connector with insulation displacement type contacts loaded therein, each contact connected to an insulation clad wire,

said machine including a first station whereat a connector is initially positioned, insertion means for simultaneously displacing each wire into its corresponding contact, a second station remote from said first station having holding means for selectively gripping said wires and further including wire cutting means, and control means for se-

quentially actuating said insertion means, holding means, and wire cutting means in a given order, the improvement comprising:

a connector carrier for mounting a connector thereon in a given disposition moveable between said first station and said second station in alignment with said wires;

said insertion means being located at the second station; and

said control means moving said connector carrier from said first station to said second station, actuating said insertion means so that said wires are displaced in their corresponding contacts, releasing said wire holding means, moving said connector carrier back to said first station drawing wire therewith, actuating said wire holding means, actuating the wire cutting means to form a completed electrical harness.

4,310,968

SHAVING APPARATUS

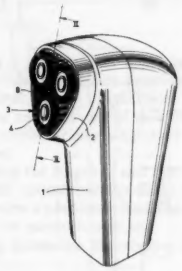
Dirk A. Buik, and Eduard W. Tietjens, both of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 18, 1980, Ser. No. 141,735

Claims priority, application Netherlands, Feb. 13, 1980, 8000884

Int. Cl.³ B26B *19/42*

U.S. Cl. 30—34.2 **6 Claims**



1. A shaving aparatus comprising a holder formed with a planar surface having a plurality of circular apertures; a circular shear plate positioned in each circular aperture, said shear plate being provided with hair-entrance apertures; a cutting unit associated with each shear plate and rotatable relative thereto; and a mat similar in area to that of said planar surface and having a plurality of circular openings respectively corresponding to said circular apertures, said mat being formed from a strip material provided with bristles and being attached to the planar surface and arranged thereon around and between the circular apertures, said bristles extending outwardly with respect to the planar surface and respectively having means at their outer ends for hooking and straightening hairs prior to engagement thereof by the hair-entrance apertures.

4,310,969

PARTIAL-CORING DEVICE

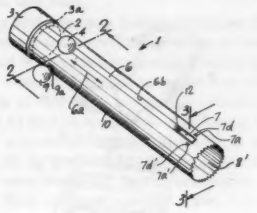
Joseph Cannizzaro, 604 E. 9th St., and Laura Winston, 56 7th Ave., both of New York, N.Y. 10009

Filed Mar. 20, 1981, Ser. No. 245,922

Int. Cl.³ A47J *25/00*

U.S. Cl. 30—113.1 **13 Claims**

1. A coring device comprising in combination: an elongated cylinder open at one end thereof and forming a channel space therein, an outer sidewall of the cylinder having a shape forming an elongated groove therein extending along a longitudinal axis thereof terminating in juxtaposition to said one end at a through-space opening passing through said outer side wall; an elongated slide member mounted within said elongated groove and having a handle mounted on a first end of the elongated slide member and having a second end of the elongated slide member adapted for attachment to a pivot member; and said pivot member being an elongated cutting structure mounted at a blunt end thereof onto said outer side wall in said through-space opening, said second end being mounted onto said pivot member such that movement of the elongated slide member



toward the one end moves said pivot member to a position in which the elongated cutting structure extends transversely through said channel space within the cylinder and such that movement of the elongated slide member away from the one end moves the elongated cutting structure to a retracted position substantially parallel with said outer side wall.

4,310,970

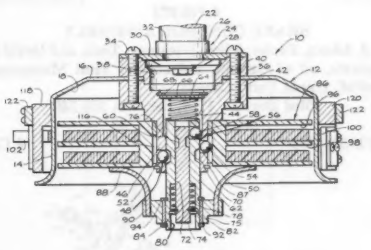
VEGETATION CUTTING APPARATUS

Dale D. Evenson, 60 Buckskin La., Rolling Hills Est., Calif. 90274, and Virgil H. Stair, 15411 Cohasset St., Van Nuys, Calif. 91406

Continuation of Ser. No. 742,963, Nov. 17, 1976, Pat. No. 4,169,311. This application Jul. 13, 1979, Ser. No. 57,851

Int. Cl.³ A01D *50/00*

U.S. Cl. 30—276 **11 Claims**



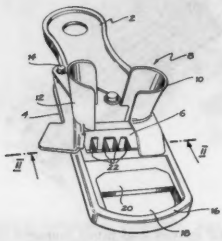
1. A housing and dispensing assembly for a cutting line member of a cutting apparatus, comprising:

a housing rotatable about an axis;

a spool mounted within said housing for winding the line member therearound and for extending the line member therefrom exteriorly of said housing to contact and cut vegetation by rapid circular movement exteriorly of said housing during rotation of said housing; and

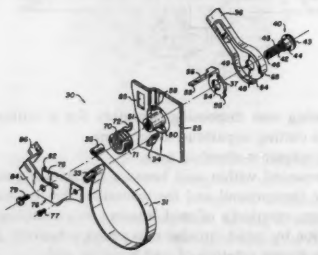
means connected to said housing for locking said spool against rotation of said spool relative to said housing and for unlocking said spool during rotation of said housing to permit said relative rotation and unwinding of the line member from said spool, said locking and unlocking means including a locking and unlocking controller having a bearing surface defining an annular recess therealong, said recess being substantially centered about said axis, said controller being movably mounted in said housing for causing said unlocking of said spool through a substantially upward movement of said annular recess with respect to said housing.

4,310,971
VEGETABLE SLICER
Geoffrey D. Rowell, Stuart St., Sydney, N.S.W., Australia (2211)
Filed Oct. 31, 1979, Ser. No. 90,060
Claims priority, application Australia, Nov. 6, 1978, PD6648
Int. Cl.[3] B26B 3/00
U.S. Cl. 30—279 R 6 Claims



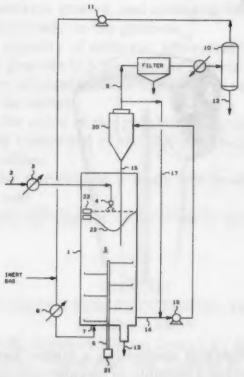
1. A vegetable slicer comprising a hand held, molded plastic body part which defines a window through which material to be sliced may pass, a series of side by side spaced blades spanning the window, each of which blades have two ends, a molded plastic retainer part which cooperates with the body part in retaining and supporting the series of side by side blades such that only the ends of the blades are supported when the two parts are assembled, wherein the body part has two mutually opposite sets of teeth adjacent the window and the retainer part has two corresponding complementary sets of teeth, which sets interfit to form a comb joint between the two parts when the latter are brought together in alignment, the ends of the blades each being imprisoned between mating surfaces of pairs of adjacent teeth.

4,310,972
BRAKE CONTROL ASSEMBLY
Gary J. Isberg, Exeter; Klaus Wickman, Trail, and David Reid, Fruitvale, all of Canada, assignors to Trail Manufacturing Limited, Huron Park, Canada
Filed Dec. 28, 1979, Ser. No. 108,240
Int. Cl.[3] B27B 17/00
U.S. Cl. 30—382 4 Claims



1. In a chain saw having a power unit mounted in a housing, an endless saw chain adapted to be driven by the power unit, and a drive-transmitting mechanism between the power unit and the saw chain; a brake control assembly comprising an operating lever extending from the housing, said operating lever having a hub portion and a guard portion adjacent a handle on the housing, pivot means securing the hub portion to a side of the housing, a brake drum associated with the drive-transmitting mechanism, a brake band encircling the brake drum and having one end anchored to the housing, an actuating plate rockingly mounted on the pivot means for movement independently of the hub portion, a cam finger on the actuating plate attached to an opposite end of the brake band, spring means tending to rock the actuating plate in one direction and urge the brake band into braking engagement with the brake drum, a resilient latch on the housing normally engaging the cam finger to hold the brake band out of braking engagement with the brake drum, a resilient retainer on the housing normally engaging the operating lever to releasably hold the lever in a brake-off position, and drive means operatively connecting the operating lever to the actuating plate whereby the actuating plate is rocked with the operating lever about the pivot means to a brake-on position of the lever only when a force at least sufficient to disengage the resilient latch from the cam finger and the resilient retainer from the lever is applied to the lever.

4,310,973
DRYING POLYMER SOLUTIONS
William R. King, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.
Continuation of Ser. No. 856,550, Dec. 1, 1977, abandoned. This application Apr. 24, 1979, Ser. No. 32,977
Int. Cl.[3] F26B 3/08, 3/10
U.S. Cl. 34—10 38 Claims



31. Process comprising:
(a) providing a mechanically agitated bed of particles; and
(b) introducing a polymer solution in solvent onto the particles of the mechanically agitated bed; wherein the bed is mechanically agitated in an amount sufficient to maintain a constant temperature above the boiling point of the solvent by input of mechanical energy and evaporate a substantial portion of the solvent.

4,310,974
SIMULATED LIGHTS FOR AN AIRFIELD MODEL
David P. Gdovin, Vestal, and Frank J. Lusk, Binghamton, both of N.Y., assignors to The Singer Company, Binghamton, N.Y.
Filed Mar. 11, 1976, Ser. No. 665,939
Int. Cl.[3] G09B 9/08
U.S. Cl. 434—42 32 Claims

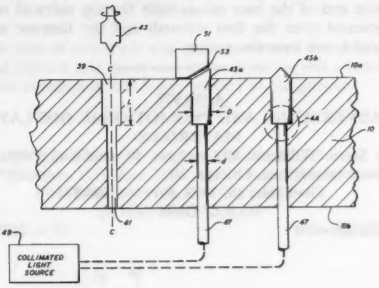
1. In display apparatus, the combination comprising:
(a) plate means having a first surface exposed for viewing, a second surface opposite said first surface, a through hole extending between said first and second surfaces, and a counterbore coaxial with said through hole and contiguous with said first surface;
(b) a first light conducting member having an input end supported within said counterbore, an output end which protrudes slightly beyond the first surface of said plate means and a length which ensures that said output end

protrudes a predetermined distance beyond said first surface; and

(c) means for illuminating the input end of said light conducting member.

24. A method of constructing a simulated airfield light on a model board, comprising the steps of:

(a) providing a counterbored hole in the model board, said hole extending through said model board with the counterbore extending from a front surface of said model board to a base at an intermediate depth within said model board;



(b) mounting a first optical fiber, having an output end which provides a specified directionality to light exiting from the fiber, in the counterbore of said counterbored hole so that an input end of said fiber overlies said hole and is circumferentially supported by the base of said counterbore;

(c) coordinating the length of said first optical fiber with the depth of the counterbore so that the output end of said fiber protrudes a predetermined distance beyond the front surface of the model board; and

(d) providing means for illuminating the input end of said fiber.

4,310,975

DREDGING OR EXCAVATING MACHINE FOR MARSHES OR CANALS

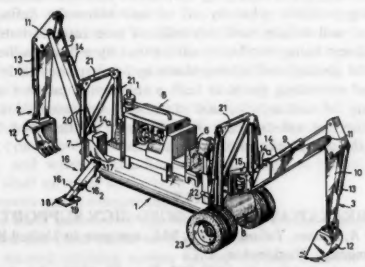
Gilbert Bibaut, 22 rue de Compiegne, 60880 Le Meux, France

Filed Apr. 8, 1980, Ser. No. 138,346

Claims priority, application France, Apr. 10, 1979, 79 08994

Int. Cl.[3] **E02F** *9/00*

U.S. Cl. 37—71 **15 Claims**



1. In a machine for dredging and cleaning out aquatic bodies such as ponds, marshes, canals, channels, and rivers and comprising a supporting structure with stabilizing feet, means for scraping and dredging said aquatic bodies, said scraping and dredging means mounted on said supporting structure for pivotal movement about a substantially vertical axis and a substantially horizontal axis, and an operating means on said supporting structure for driving and controlling said scraping and dredging means, the improvement wherein:

said supporting structure comprises a central longitudinally extending fluid-tight substantially cylindrical body having a low coefficient of friction with the ground and a base which is beveled at opposite front and rear ends of said body, and wherein said feet are telescopic toward and away from said body;

said scraping and dredging means comprises shovel means for excavating, said shovel means being mounted adjacent each of said body ends for pivoting through an angle of at least 180° from one lateral side of said body to an opposite lateral side of said body about said substantially vertical axis, each of said shovel means comprising first and second arms articulated together, said second arm mounted on said body for pivoting about said substantially vertical axis, a ground-engaging bucket articulated to said first arm, and fluid operated cylinder means for shifting said arms and bucket relative to each other and to said body, said shovel means and said telescopic feet being selectively operable for excavating, for displacing said machine along the ground longitudinally of said body, and for displacing said machine transversely of said body.

4,310,976

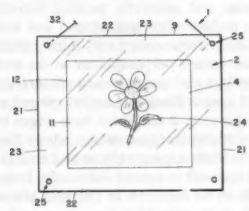
PICTURE DISPLAY DEVICE

Stanley M. Wilten, 2145 Sandy Shore, S.E., Grand Rapids, Mich. 49506

Filed Oct. 24, 1979, Ser. No. 87,700

Int. Cl.[3] **G09F** *1/12*

U.S. Cl. 40—152.1 **3 Claims**



1. A picture display device, comprising:

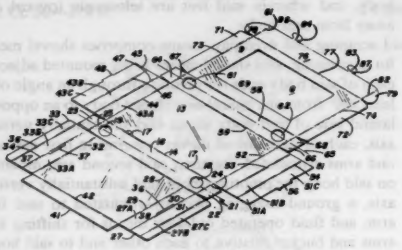
first and second panels having a substantially similar shape with substantially coextensive marginal edges; said panels being adapted to assume an overlying relationship in an assembled condition for receiving a picture therebetween; at least one of said panels being transparent, and adapted to overlie an image side of said picture for viewing the picture therethrough, the other being at least translucent;

means for interconnecting said first and second panels in an aligned relationship, wherein adjacent portions of said marginal edges are disposed substantially coplanar, and retaining said panels in the assembled position for mounting a variety of differently shaped pictures therebetween without a separate mat, and simultaneously forming an attractive ornamental border about said picture to focus attention on the image; and wherein said marginal edges are unpolished, whereby when said device is exposed to light, said marginal edges produce a light scattering line border about said device which appears substantially unconnected with the picture.

4,310,977
DISPOSABLE SCROLL HOLDER

Robert Swenson, 1932 Utica Pike, Jeffersonville, Ind. 47130

Filed Sep. 26, 1980, Ser. No. 191,179
Int. Cl.[3] G09F 11/18, 11/12
U.S. Cl. 40—518 1 Claim

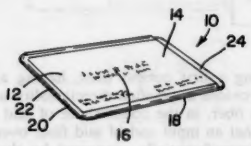


1. A scroll winding and unwinding device including a support structure formed from a planar blank of a stiff material including a generally rectangular planar base with cooperative slot means, first generally rectangular sidewall means hingedly extending from a first edge of the base means including aperture means of first diameter adjacent opposite ends of the first sidewall in central relation on a line parallel to the first edge of the base means and first and second tab means hingedly extending outwardly from opposed first and second edges of the first side wall and generally rectangular planar platen means hingedly extending outwardly from a portion of the third edge of the first sidewall opposite said first edge of said base means having a length less than the length of the said edge of said first sidewall including first and second platen tab means hingedly extending outwardly from first and second generally opposed edges of the platen means where each of said first and second platen tab means are creased along first and second crease lines extending generally parallel to the first and second platen edges to provide three segments and platen slot means are cut in said first crease and generally parallel thereto and where said base means includes first and second end walls extending hingedly outwardly from second and third generally opposed edges of said base means perpendicular to the ends of the first edge where the first and second endwalls are provided with first and second crease lines in parallel spaced relation from and parallel to the second and third base edges to define base second and third endwall segments and where first and second end tabs are provided respectively at the end of each of the first and second endwall to extend outwardly from the first and second endwalls to be received in the said platen slot means when the blank is in assembled form, generally rectangular second sidewall means extending outwardly from a fourth edge of said base means between the second and third edges of said base means including second and third aperture means at opposite ends of the second sidewall, each in aligned relation with one of the first and second apertures along lines parallel to the second and third edges of the base means and along a line parallel to the fourth base edge, and third and fourth tab means hingedly extending outwardly from opposite edges of the second sidewall means; and generally rectangular top means having dimensions equal to the base means extending outwardly from a third edge of the second sidewall means opposite the fourth edge of the base means including a central viewing aperture, first and second top tab means extending outwardly from first and second edge of the top at opposite ends of the top and top wall means extending outwardly from a third edge of the top means opposite the third edge of the second sidewall with fastener tab means carried by the outermost edge of the top wall means adapted to be received in the base slot means where the blank can be assembled with the edge of the platen opposite the third edge of the first sidewall abutting the innermost surface of the second sidewall adjacent the third edge thereof, the platen tab means folded to form channels at opposite ends of the platen with a first segment extending downwardly from the platen to the base, a second segment resting on and parallel to the base and a third segment, so the first and third and second and fourth apertures respectively, are in aligned relation through the channels with the first, second, third and fourth tabs inturned, the tab folded over the platen, with the first segment of each base endwall turned upwardly, the second endwall segment turned downwardly so a third platen endwall segment and the first and third tabs and the first top tab are enclosed thereby at one end of the base means and a third platen endwell segment and the second and fourth and second top tab means are enclosed thereby at its opposite end of the base means with the top sidewall means downturned over the first sidewall and the fastener means received in the base slot means.

4,310,978
ADVERTISING AND PROMOTIONAL DISPLAY MATERIALS

Larry Stern, Wilmette, Ill., assignor to American Printers & Lithographers, Inc., Chicago, Ill.

Filed Dec. 18, 1979, Ser. No. 104,871
Int. Cl.[3] G09F 7/04
U.S. Cl. 40—600 7 Claims



1. An article for displaying advertising or the like, said article comprising, in combination, a mounting portion including a body of an elastomeric material having embedded therein a plurality of magnetic particles, thereby rendering said mounting portion capable of being adhered to a magnetically permeable substrate, said body having a continuous rear surface portion adapted to be received over said substrate, an oppositely directed front surface portion, and sidewall portions extending between and joining said front and rear surfaces to each other, an intermediate opaque sheet of a thermoplastic material bonded by a pressure-sensitive adhesive to said front surface portion of said body, and a cover sheet closely overlying said intermediate sheet, said intermediate sheet and said cover sheet also having respective oppositely directed non-adherent surfaces and outer outer edges formed by sidewalls coextensive with and aligned in overlying relation to said sidewalls of said mounting portion, whereby all of said sidewalls define the shape of said article, said sidewalls of said intermediate and cover sheets being bonded to each other by a fused, adhesiveless bond joining said intermediate and cover sheet sidewalls only and extending about at least a substantial portion of the periphery of said article, said cover and intermediate sheets being thereby substantially free from a visible bond lying within the outer margin of said sheets.

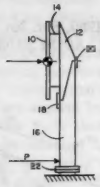
4,310,979
BREAKAWAY DUAL-LEGGED SIGN SUPPORT

Jeffrey A. Bloom, Takoma Park, Md., assignor to United States of America, Washington, D.C.

Continuation of Ser. No. 860,527, Dec. 14, 1977, abandoned.
This application Apr. 19, 1979, Ser. No. 31,681
Int. Cl.[3] G09F 15/00
U.S. Cl. 40—607 1 Claim

1. A support leg for a sign, comprising: an upper portion fixed to said sign, said upper portion having a front side facing said sign and a back side opposite said front side; a lower portion having corresponding front and back sides connected

to said upper portion by a hinge, said hinge being in line with the vertical center of wind load on said sign and connecting



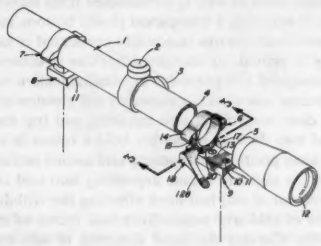
said back sides of said upper and lower portions; a fuse joining said front sides of said upper and lower portions; and a breakaway joint connecting said lower portion to the ground.

4,310,980

QUICK DETACHABLE SCOPE MOUNT

Phillip Pilkington, P.O. Box 2284, Enid, Okla. 73701

Filed Nov. 19, 1979, Ser. No. 95,650
Int. Cl.³ F41G *1/38*
U.S. Cl. 42—1 ST **11 Claims**



1. In a detachable scope mount for a gun comprising a base having an outer rear flat surface and fixable to the receiver of the gun, the flat surface being located on a plane parallel to the axis of the bore of the gun and perpendicular to a line radial to the axis of the base of the gun; a front mount rigidly fixed to the front portion of the scope and attached to the base in a manner such that movement of the scope only in a plane parallel to the flat surface is possible; a rear mount rigidly fixed to the rear portion of the scope and having a flattened surface contacting and parallel to the rear flat surface of the base when the front portion of the scope is mounted on the base and having two outward facing opposing convexoid surfaces; such that when the rear mount is positioned so that the scope is aligned with a plane passing outward from the axis of the gun bore and at a 90° angle to the plane of the flattened surface, a bore passes through the base parallel to the flattened surface and perpendicular to the bore of the gun and parallel to the axis of the convexoid surfaces; wherein a first latching means having a shaft member of size such as to be snugly turnable and insertable in the bore in the base and having a head member having an inner concavoid surface matable with one of the convexoid surfaces, and wherein the first latching means is positioned with its shaft member in the bore in the base;

the improvement comprising:

(a) the shaft member of the first latching means being adjusted and fixed in the bore in the base;

(b) a second latching means having a head member and threads matable with threads centering on the axis of the bore in the base and an inner concavoid surface matable with the other convexoid surface of the rear mount;

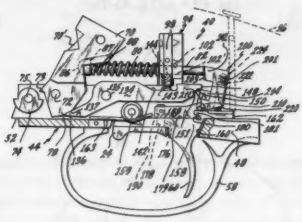
such that when the second latching means is screwed on or in the threads centering on the axis of the bore in the base, the scope is fixedly centered; the improvement further characterized in that the head of the second latching means is sufficiently truncated along a plane parallel to the bore through the base such that the rear mount will pass over the truncation when the second latching means is unscrewed in the unlatched position such that the truncation is parallel to the flattened surface of the base.

4,310,981

SELECTIVE TRIGGER UNIT FOR MULTIPLE BARREL FIREARMS

Richard G. Waddell, Gardena, Calif., assignor to Eric A. Stern, Aspen, Colo.

Filed Sep. 7, 1979, Ser. No. 73,222
Int. Cl.³ F41C *19/00*
U.S. Cl. 42—42 R **12 Claims**



1. In a multi-barrel firearm, in combination, individual hammers and sears associated with each barrel, trigger means for actuating the sears individually, sear release means positioned to be actuatable by the trigger means for actuating either one of the individual sears, said sear release means being mounted to be positionable to actuate a second sear after a first has been actuated, and means related to the sear release means whereby upon actuation of the first sear, the said sear release means is moved whereby to actuate the second sear upon a further pull of the trigger, said related means being constructed to be independent of recoil and counter-recoil of the firearm.

4,310,982

MAGAZINE SPRING RETAINER AND CAP DETENT SYSTEM

Jack L. Kast, Ilion, N.Y., and Edgar J. Young, Beacon Falls, Conn., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Feb. 26, 1980, Ser. No. 124,799
Int. Cl.³ F41C *27/00, 25/08*
U.S. Cl. 42—75 B **8 Claims**

1. In a firearm having a tubular magazine, a cap screwed onto one end of the magazine, and a spring located within the magazine for urging cartridges toward the other end thereof, said firearm further including means for retaining the spring within the tubular magazine when the cap is removed and also for restraining the cap from becoming unscrewed accidentally comprising:

a cylindrical member having a plurality of slots extending longitudinally along its surface and a first detent surface at one end thereof;

indent means associated with the tubular magazine and adapted to cooperate with said slots for inserting the cylindrical member and maintaining said member fixed within the tubular magazine; and

a second detent surface associated with the cap and disposed

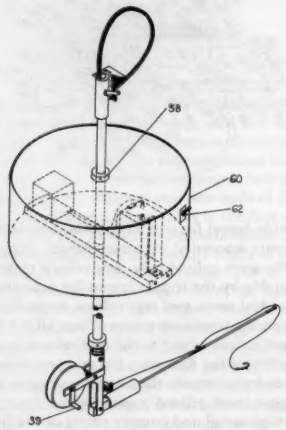
for engagement with the first detent surface as the cap is tightened in order to restrain the cap against accidental rotation.

4,310,983

AUTOMATIC TIP UP FISHING DEVICE

Dee L. Irvin, Star Rte., White Lake, Wis. 54491, and Walter C. Strong, Star Rte., Polar, Wis. 54468

Filed Jan. 28, 1980, Ser. No. 115,719
Int. Cl.³ A01K *85/01*
U.S. Cl. 43—17 **3 Claims**



1. An ice fishing device comprising: a housing having a top and sides, the sides adapted to rest atop the ice and the housing bridging and covering the usual ice fishing hole which is formed in the ice;

a hollow shaft having a distal end and a proximate end, said hollow shaft demountably affixed to and passing through said housing, the longitudinal axis of said hollow shaft being generally perpendicular to said housing and the water below; the distal end of said hollow shaft extending into the water, the proximate end of said hollow shaft extending above such housing;

signal means connected to the proximate end of said hollow shaft;

a fishing rod comprising a fishing rod frame, a fishing rod handle pivotally attached to such frame, a reel for fishing line and fishing line such being mounted on the distal end of said hollow shaft, such fishing rod handle being spring biased into a direction generally perpendicular to the longitudinal axis of said hollow shaft and projecting radially therefrom

signal triggering means responsive to a pull on a fishing line comprising;

an internal shaft mounted within the hollow shaft; such internal shaft having a distal end and a proximate end;

the proximate end of said internal shaft having a projection extending radially therefrom;

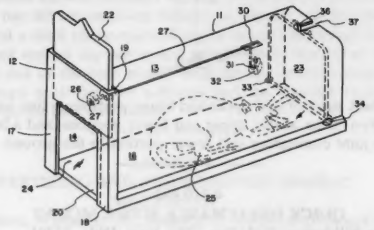
the distal end of said internal shaft having formed thereon a yoke, the fishing line being threaded through such yoke, such yoke being located between the fishing rod handle and the reel whereby a pull on the line causes the yoke to turn the internal shaft with its radial projection actuating the signal means.

4,310,984

RODENT AND ANIMAL TRAP

Fred A. Brubaker, Jr., 336 Mitchler Ave., Murphys, Calif. 95247

Filed Apr. 3, 1980, Ser. No. 136,939
Int. Cl.³ A01M *23/00*
U.S. Cl. 43—61 **3 Claims**



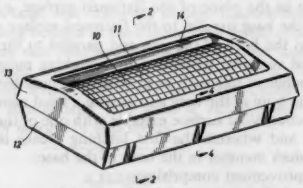
1. A rodent and animal trap comprising an elongated hollow body consisting of an integral opaque plastic top and a pair of opaque plastic sides as well as a channeled front section defining an animal entrance, a transparent plastic bottom, and a pair of transparent end closures removably connected to said elongated body to provide an elongated box-like structure having an inner elongated compartment in communication with said animal entrance; one of said transparent end closures constituting a trap door controlling said entrance, and trip means engaging said trap door to releasably hold a recess in said trap door in a raised position and opening said animal entrance, and a bait hook on said trip means depending into said compartment; movement of said bait hook effecting the withdrawal of engagement of said trip means from said recess of said trap door thereby effecting the rapid dropping of said trap door onto said bottom of said body and the closing of said animal entrance to trap an animal in said compartment for subsequent disposal; the tip of said trip means reengageable with said recess of said front door to automatically relatch said door in a raised position upon the flipping of said elongated body.

4,310,985

DEVICE FOR COMBATTING FLIES

James P. Foster, Modesto, and Walter T. Reed, Oakdale, both of Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 14, 1979, Ser. No. 103,323
Int. Cl.³ A01M *1/20*
U.S. Cl. 43—131 **13 Claims**



1. A device for combatting flies comprising:

(a) a target area of porous material comprising a sloped surface containing a dosage of tetrahydro-2-(nitromethylene)-2H-1,3-thiazine insecticide lethal to flies,

(b) a closely fitting grill covering said target area but allowing contact by the flies thereon,

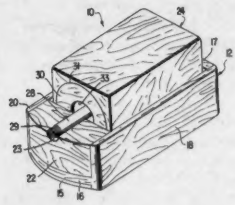
(c) a sloped supporting member for said target area comprising a solid sheet of rigid impermeable material shaped to conform with the shape of the target area and having its

upper surface affixed to the target area so as to support and define the configuration of the target area,

(d) a hollow base section having a bottom and side or sides surrounding the bottom and perimeter of said sloped target area supporting member, the side or sides of said base section extending up a sufficient distance to form a cavity between the side or sides of the base section and the target area supporting member, said cavity being of sufficient size for the containment and concealment of intoxicated flies; the base section being attached to the sloped supporting member such that a refillable reservoir for fluid storage or containment is formed in the hollow base section, said reservoir being defined on its top by the sloped supporting member and on its bottom by the bottom of the base section, and

(e) a means of establishing fluid contact between said target area and said refillable reservoir.

4,310,986
GAME CALL
Trigg R. Jacobs, Rte. #3, Box 489, El Dorado, Ark. 71730
Filed Oct. 31, 1980, Ser. No. 202,768
Int. Cl.³ A63H *5/00*
U.S. Cl. 46—189 **7 Claims**

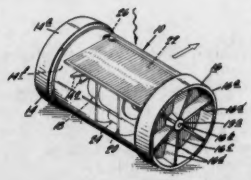


1. A game call of the type having a sound block with an open ended cylindrical bore and a vibratory peg mounted within and extending coaxially from the bore of said sound block, and a sound box on which said peg is moved to produce calls, the improvement comprising:

a sound board secured to said sound block at the open end of said bore, said sound board having a central aperture through which said peg extends, the diameter of said aperture being less than the diameter of said bore; and

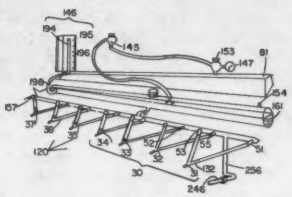
a groove machined in the front end piece of said sound box so that said sound block nests inside said sound box with said peg resting on said groove.

4,310,987
AMUSEMENT DEVICE
Joseph M. Chieffo, 1023 Yates Ave., Marcus Hook, Pa. 19061
Filed Apr. 24, 1980, Ser. No. 143,498
Int. Cl.³ A63H *1/00, 17/00*
U.S. Cl. 46—251 **1 Claim**



1. An amusement device comprising a transparent cylindrical housing having two opposed wheels, containing an axially mounted solar powered motor, means on each wheel for mounting the armature shaft of said motor, solar cells attached to said motor and electrically connected thereto and a weight attached to said motor, whereby, when said device is empowered by light, said energized motor effects rolling motion to said device.

4,310,988
APPARATUS FOR SELECTIVE FIELD APPLICATION OF HERBICIDES TO WEEDS
George D. Porter, Jr., P.O. Box 1887, Lubbock, Tex. 79408
Filed Nov. 19, 1979, Ser. No. 95,371
Int. Cl.³ A01M *21/00*
U.S. Cl. 47—1.5 **1 Claim**



1. Apparatus for dispensing a liquid herbicide agent to weeds lying in a path of travel comprising, in combination:

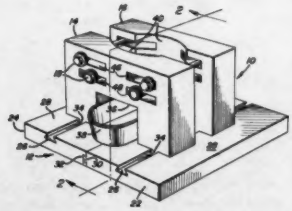
a support frame movable along the path of travel;

a plurality of stand-off bars projecting forwardly of said support frame in the direction of travel along said path;

a plurality of rope applicators each having end portions mechanically coupled to said support frame on opposite sides of a stand-off bar with an intermediate portion of each rope applicator being engaged and supported by a stand-off bar forwardly of and in spaced relation with said support frame whereby a length of each rope applicator is held in transverse relation to the path of travel and defining an acute angle with respect to the path of travel on opposite sides of each stand-off bar thereby defining a repeating "V" formation; and,

means coupled in fluid communication with each rope applicator for wetting an end portion of each rope applicator with the liquid herbicide agent.

4,310,989
TREE STAND
Edward J. Shannon, Jr., 3104 Jessica St., Metairie, La. 70003
Filed May 28, 1980, Ser. No. 154,061
Int. Cl.³ A47G *33/12*
U.S. Cl. 47—40.5 **2 Claims**



1. A collapsible tree stand, said stand including a horizontal base having opposite side marginal portions, a pair of edge upstanding and generally parallel clamp panels, the opposite ends of the lower marginal edges of said clamp panels and said opposite side marginal portions of said base including coacting releasably engageable anchor means anchoring said clamp panels to said base for guided shifting relative thereto toward and away from each other and against angular displacement of said clamp panels relative to said base, clamp means operatively connected between the upper marginal portion of said

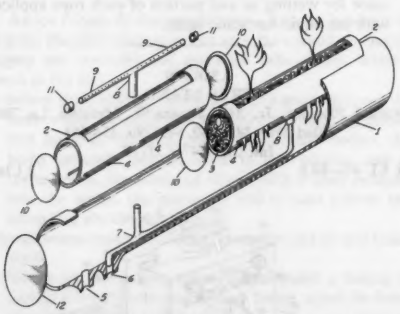
clamp panels for applying thrust forces thereon to clamp a tree trunk portion therebetween, said clamp panels defining opposing upstanding generally partial cylindrical recesses for embracing opposite side portions of said trunk portion, said coacting anchor means including a pair of parallel upwardly opening dovetail grooves formed in said base and including at least one pair of ends opening endwise outwardly of the adjacent marginal edge of the base and transverse dovetail splines formed on the lower marginal portions of said clamp panels slidingly received in said grooves, said dovetail grooves and splines being functional to frictionally resist shifting of said clamp panels to said base in response to said thrust forces being applied to said clamp panels at elevations therealong spaced above said base, said clamp means including means operative to apply said thrust forces on areas of said clamp panels spaced above said base, the lower portions of said clamp panels including registered downwardly opening notches formed therein, a shallow elongated water tray, resting on said base and having its opposite ends received in said notches, said clamp means comprising removable clamp-type fasteners extending between and operatively engaged with said clamp panels for drawing the latter toward each other, said clamp panels being positionable, when said stand is disassembled, in horizontal positions superimposed on said base with said partial cylindrical recesses opening upwardly and said notches opening toward and registered with each other, said tray being positionable on said base with the opposite end portions of said tray received in said notches, said clamp-type fasteners, when removed, being receivable in said upwardly opening partial cylindrical recesses.

4,310,990

HYDROPONICS

Robert L. Payne, 1315 N. Cherokee Ave., Los Angeles, Calif. 90028

Filed May 6, 1980, Ser. No. 147,176
Int. Cl.[3] A01G *31/02*
U.S. Cl. 47—59 **3 Claims**



1. A device for the hydroponic cultivation of plants, consisting of:

two horizontal tubes, of opaque, water-proof, and rigid plastic, sealed at their ends, of substantially equal length, the axes of the tubes parallel on the same vertical plane, that is, one tube above the other, the lower tube slotted to receive less than one-half the circumference of the upper, the length of the upper tube thus resting within and above the length of the lower;

said upper tube slotted lengthwise to receive seeds, transplanted cuttings, and inert medium for the anchoring and protection of the plant roots;

said upper tube containing perforated piping which parallel to the axis of the tube and covered by the inert medium, extends throughout the length of the upper tube so as to distribute nutrient solution evenly to the roots of the several plants which may be contained in the inert medium;

said upper tube, the ends of the tube removable to allow cleaning;

said upper tube containing perforated piping, the ends of the perforated piping removable to allow cleaning;

said upper tube being slit repeatedly, the slits being parallel to the tube's axis and extending throughout its length in the fraction of its circumference which rests within the lower tube, said slits allowing the nutrient solution distributed by the piping to the roots of the plants to drain from the upper tube, the slits also allowing the roots of the plants to grow downward so as to follow the solution draining from the upper tube;

a lower tube slotted to receive the upper tube, the length of the upper tube fitting into the slot so as to create a seal excluding daylight, insects, and ambient air, the slits of the upper tube thus sealed within the lower tube;

whereby a substantial seal is created to protect roots depending from said upper tube and a closed channel is defined to contain liquid draining from the upper tube;

said lower tube having ends which are removable to allow cleaning;

said lower tube fitting with sockets for drainage and the input of nutrient solution;

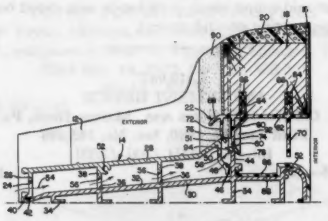
said lower tube containing a pipe connecting the interior aperture of the solution input socket to the perforated pipe of the upper tube, so that nutrient solution enters the lower tube through the input socket, flows through the pipe contained within the sealed channel of the lower tube to the perforated pipe of the upper tube, the perforated pipe distributing the nutrient solution to the roots of the plants which may be supported in the upper tube, the nutrient solution flowing over the roots hanging from the upper tube, the lower tube capturing the unabsorbed solution, then channeling the solution to the drain.

4,310,991

DOOR SEALING SYSTEM

James R. Seely, Rochester, Mich., assignor to Embossed Door Corporation, Detroit, Mich.

Filed Sep. 26, 1979, Ser. No. 79,022
Int. Cl.[3] E06B *1/70*
U.S. Cl. 49—470 **15 Claims**



1. A sealing system for an inwardly swinging door comprising:

a threshold member having an elongated open-ended channel defined by an exterior wall having a vertically extending portion of a given height serving as a door stop and an inclined lower portion meeting a spaced vertically extending interior wall of lesser height;

a first resilient sealing plate vertically depending from bottom portions of the door and having a given length, operative to overlappingly contact the interior channel wall to provide a primary air seal between the exterior and the interior;

a second resilient sealing plate vertically depending from bottom portions of the door for overlappingly contacting the exterior channel wall, said second sealing plate having

a shorter length than said first sealing plate, the extent of the projections of said walls and plates being such that the plates come into contact with their respective walls free from interference with other portions of the threshold, and such that the vertical overlap between the plates and walls provides continuous contact therebetween to automatically accomodate for misalignment between the door and threshold; and

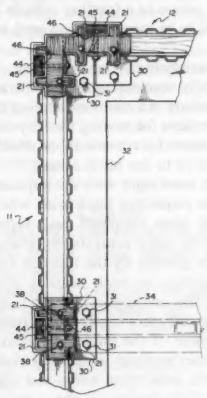
venting means in the threshold member including passageways from frontal portions thereof through said lower portion of the exterior channel wall, adapted for equalizing the pressure differential between the channel and the exterior air to thereby minimize seepage of moisture under the second seal while the first seal blocks the air from entering the interior.

4,310,992

STRUCTURAL PANEL

Pierre J. Thabet, Beauce, Canada, assignor to Construction Murox, Inc., Quebec, Canada

Filed Feb. 20, 1980, Ser. No. 123,072
Claims priority, application Canada, Sep. 20, 1979, 336016
Int. Cl.³ E04C *2/26, 2/08;* E04B *1/76*
U.S. Cl. 52—309.11 **7 Claims**



1. A structural building panel comprising interior and exterior skins, the vertical edges of which are connected to pairs of hat shaped cross section vertical members, said vertical members being arranged with the channel portions of the sections facing each other and spaced apart by horizontal girts between said skins joined to the hat shaped vertical members, the space between said skins being filled with insulation.

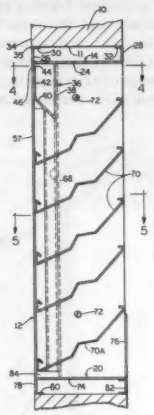
4,310,993

LOUVER ASSEMBLY

Thomas B. White, Turtle Creek Township, Warren County, Ohio, assignor to Louvers & Dampers, Inc., Cincinnati, Ohio

Filed Jan. 7, 1980, Ser. No. 110,172
Int. Cl.³ E06B *7/08*
U.S. Cl. 52—473 **6 Claims**

1. A louver assembly which comprises a frame including a transverse upper member, upright side members, and a transverse lower member, a plurality of vertically spaced louver blades spanning the side members, a gutter member overlying the louver blades and underlying the upper member, the gutter member including an outer wall panel having an upper edge terminating beneath an outer face of the upper member to define a transverse water inlet opening receiving rain water from the transverse upper member, enclosed downspout means in one of the side members receiving water from the gutter member and conducting the water from the gutter member past the louver blades, and means in one of the side members for receiving water from the louver blades, the downspout



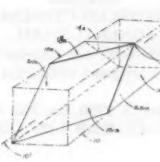
means being isolated from the means for receiving water from the louver blades.

4,310,994

COMPLEMENTARY GEOMETRIC MODULES

Roland Gephardt, New York, N.Y., assignor to Autonomics, Inc., New York, N.Y.

Filed Oct. 16, 1979, Ser. No. 85,266
Int. Cl.³ E04C *2/04*
U.S. Cl. 52—608 **7 Claims**



1. Complementary pairs of geometric modules for forming structural shapes, each generated from a rectangular prism, with two opposite end faces, one of the end faces forming a right angled quadrangle, and the other end forming a obligue angled quadrangle, both end faces obliquely formed with respect to the longitudinal axis of the prism, each of said modules being the reverse or mirror shape of its complementary module, said module and its complement being non-identical modules.

4,310,995

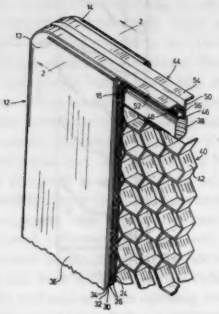
PANEL ASSEMBLIES AND COMPONENTS

Gary D. Hanna, 6 Shamokin Dr., Don Mills, Ontario, Canada (M3B 2V1)

Continuation of Ser. No. 963,744, Nov. 27, 1978, abandoned.
This application Jun. 20, 1980, Ser. No. 161,500
Claims priority, application Canada, Sep. 26, 1978, 312146
Int. Cl.³ E04C *2/34*
U.S. Cl. 52—806 **10 Claims**

1. A panel assembly comprising a composite panel-like body having a generally rectangular shape with curved corners, the body including two spaced wall structures each comprising at least one panel member of board-like material, the body having a peripheral edge extending therearound, with a groove having

a bottom surface in the peripheral edge extending around the body, and a metal framing member seated in the groove and extending around the periphery of the body, said framing member comprising structural framing corner members each comprising first, second and third portions of a U-shaped channel of extrudable metal having opposed side walls and a bottom forming wall and flanges extending laterally in opposite directions from respective side walls, at least one of which side walls has longitudinally extending serrations, the first and



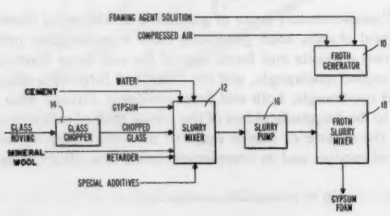
second portions being straight and lying to opposite sides of the curved corners with their bottom forming walls at 90° to each other and the third portion being arcuate and joining said first and second portions, the height of the side walls of the first, second and third portions being substantially the same; the first and second portions of adjacent corner members adjoining each other, the wall structures engaging the outer surfaces of the walls and the undersurfaces of the flanges of the framing member.

4,310,996

CEMENT REINFORCED GYPSUM FOAM WITH MINERAL WOOL

Robert F. Mulvey, Malvern, and Charles E. Crepeau, Centre Square, both of Pa., assignors to General Electric Co., Philadelphia, Pa.

Filed Apr. 23, 1980, Ser. No. 142,912
Int. Cl.³ E04B *2/00, 5/00*
U.S. Cl. 52—809 **6 Claims**



1. A thermally insulating composite assembly, comprising generally at least one structural surface element and a low-density cellular gypsum material positioned adjacent to said surface element, said cellular gypsum material comprising a gypsum matrix having minute cavities homogeneously distributed therein, said gypsum material having a dry density of less than about 6 pounds per cubic foot and a thermal coefficient of less than about 0.37, said gypsum matrix including therein:

(a) approximately 1 to 15 percent by weight of a cement dispersed homogeneously throughout said gypsum matrix;

(b) approximately 0.5 to 7 percent by weight of a mineral wool dispersed homogeneously throughout said gypsum matrix; and

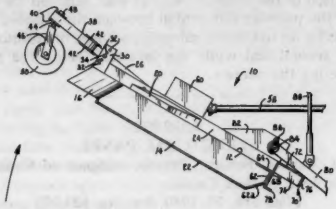
(c) at least approximately 0.25 percent by weight of a chopped glass distributed homogeneously throughout said gypsum matrix.

4,310,997

TWO POINT HITCH CONSTRUCTION

Paul Streicher, Rte. 1, Box 107, Garden City, Mo. 64747

Filed Apr. 30, 1980, Ser. No. 145,382
Int. Cl.³ A01D *35/262*
U.S. Cl. 56—15.9 **5 Claims**



1. A two point hitch device for an implement to couple the implement at two points to a traction vehicle having a pair of hitch arms adapted to be raised and lowered, said hitch device comprising:

a pair of plate members on the implement;

means for pivotally connecting the hitch arms to the respective plate members in a manner coupling the implement to the traction vehicle for towing thereby and establishing a generally horizontal pivot axis about which the implement is pivotal relative to the hitch arms;

a pair of support arms rigid with the implement and located to underlie the respective hitch arms when same are connected to said plate members, said support arms being spaced below the hitch arms during towing of the implement along the ground by the traction vehicle; and

a rigid upper surface on each support arm located to be contacted by the corresponding hitch arm upon initial raising of same sufficient to effect a predetermined relative pivotal movement of the implement relative to the hitch arms, said upper surfaces remaining rigidly against the respective hitch arms upon additional raising of same to effect raising of the implement above the ground with the contact between said support arms and hitch arms preventing relative pivotal movement between the implement and hitch arms during such additional raising of the hitch arms.

4,310,998

GRASS COLLECTION CART

Ronald R. Cuba, Plymouth, Wis., assignor to Gilson Brothers Company, Plymouth, Wis.

Filed May 21, 1980, Ser. No. 151,840
Int. Cl.³ A01D *35/22*
U.S. Cl. 56—202 **15 Claims**

1. A grass collection cart for accumulating the airborne grass clippings discharged by the grass discharge outlet of a rotary lawn mower, said cart comprising,

a frame attachable to said rotary lawn mower,

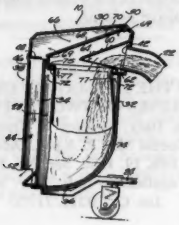
spaced walls on said frame defining an enclosed interior grass storage area having a closed bottom portion and one of said walls having an inlet opening spaced above said closed bottom portion,

a grass discharge chute attachable to the grass discharge outlet of the rotary lawn mower and to said inlet opening for conducting the airborne grass clippings from the grass discharge outlet into said interior grass storage area in response to lawn mower operation,

passage means connected to said frame for discharging air

from said interior grass storage area, said passage means defining an air discharge passage having an intake end spaced from said closed bottom portion and communicating with said interior storage area and said air discharge passage channeling the air being discharged from said intake end toward said closed bottom portion for discharge of said air to the atmosphere adjacent the bottom of said cart and close to the ground, and

means on said frame and communicating with said inlet opening for directing the incoming flow of airborne grass



clippings entering said interior grass storage area through said inlet opening toward said closed bottom portion of said interior storage area and away from said intake end of said air discharge passage, whereby the incoming flow of air is directed toward said closed bottom portion and is deflected by said closed bottom portion and redirected toward said air discharge passage intake end and grass clippings settle into said closed bottom portion as the outgoing flow of air proceeds away from said closed bottom portion and toward said intake end of said air discharge passage.

4,310,999

ROTARY BLADE FOR PRUNING MACHINES

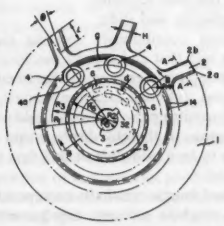
Toshikatsu Onoue, Hyogo, Japan, assignor to Sanny Industry Co., Ltd., Hyogo, Japan

Filed Jul. 17, 1979, Ser. No. 58,380

Claims priority, application Japan, Jul. 17, 1978, 53-98788; Aug. 19, 1978, 53-101150; Nov. 1, 1978, 53-135287; Feb. 21, 1979, 54-22247

Int. Cl.³ A01D *55/18*

U.S. Cl. 56—295 **18 Claims**



1. A rotary blade for a pruning machine possessing good tensile strength, good tear resistance, good abrasion resistance, good light stability, and good flexibility which comprises

a disc portion and cutting blade portion, said cutting blade portion including a plurality of cutting blades projecting radially from the periphery of said disc portion, said disc portion and cutting blade portion being made of a flexible, high molecular weight, elastomeric material selected from the group consisting of natural rubber, styrene-butadiene rubber, polychloroprene, cis-1,4-polyisoprene, cis-1, 4-polybutadiene, syndiotactic 1,2-polybutadiene, ethylene-propylene copolymer, ethylene-propylene rubber, butyl rubber, polurethanes, polyester elastomers, Hypalon^R (CSM), polyvinyl ethers, polypropylene oxide, epoxy resins, polystyrene, polybutadiene block copolymers, butadiene-ethylene copolymer, isobutyleneisoprene copolymer, chlorosulfonated polyethylene, organic polysulfides, acrylic rubbers, and ethylene-vinyl acetate copolymer,

a mounting hole disposed in the center of the disc portion,

a rigid core member embedded in the elastomere surrounding the mounting hole wherein the diameter of said core member is from about one-third to about one-half that of the diameter of the rotary blade, and

a plurality of buffering holes disposed along the periphery of the disc portion along the radii connecting the center of the disc portion with the body of each cutting blade portion.

4,311,000

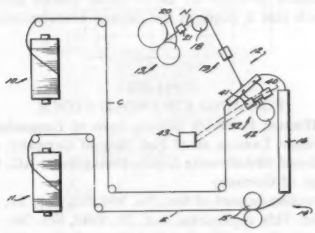
NOVELTY YARN PRODUCTION

Joe F. London, Jr., Greensboro, and Charles D. Pugh, Burlington, both of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Aug. 29, 1979, Ser. No. 71,027

Int. Cl.³ D02G *1/16, 3/36*

U.S. Cl. 57—6 **9 Claims**



1. A jet for producing novelty yarn comprising

a body member;

a first yarn port in said body member for the introduction of a core yarn;

a second yarn port in said body member for the introduction of an effect yarn, said second yarn port being substantially in-line with said first yarn port, a common passageway being provided;

a third yarn port in said body member for the passage of a combined yarn comprising the combined effect and core yarns, said third yarn being substantially transverse to said common passageway, all of said yarn ports being in operative communication in said common passageway within said body member;

a first fluid introduction port formed in said body member and in operative communication with said second yarn port;

a second fluid introduction port formed in said body member and in operative communication with at least one of said yarn ports; and

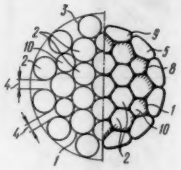
valve means for controlling the supply of fluid to said first and second fluid introduction ports to cause fluid to be introduced thereinto to produce a novelty yarn by acting upon at least said effect yarn.

4,311,001

METHOD FOR MANUFACTURING TWISTED WIRE PRODUCTS AND PRODUCT MADE BY THIS METHOD

Mikhail F. Glushko, prospekt Shevchenko 15/5, kv. 17; Viktor K. Skalatsky, ulitsa Zhukovskogo, 5, kv. 25; Vyacheslav G. Emelyanov, ulitsa Izvestkovaya, 81, kv. 32, all of Odessa; Sergei F. Korovainy, ulitsa Vokzalnaya, 70, kv. 29; Mikhail S. Koroschenko, ulitsa Vokzalnaya, 15, both of Khartsyzsk; Leonid D. Solomkin, ulitsa Generala Shvychina, 40, kv. 10, Odessa, and Mikhail I. Stukalenko, ulitsa 50-letiya Oktyabrya, 70, selo Dobroulexandrovka, Ovidiopolsky raion, all of U.S.S.R.

Filed Dec. 8, 1978, Ser. No. 967,607
Int. Cl.³ D07B *1/06*
U.S. Cl. 57—215 **8 Claims**



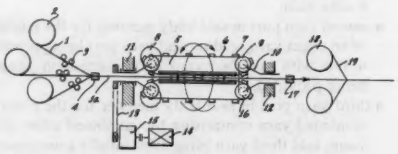
1. A method for manufacturing twisted wire products having a core and a wound layer of wires located therearound and in contact therewith, comprising the steps of winding and laying wires directly on the core of the product to form at least one wound layer having peripheral spaces between its wires, said peripheral spaces constituting from 15 to 70 percent of the diameter of the wound wires, and applying compression to the partly finished product so as to cause plastic deformation thereof such that it acquires the desired cross-sectional shape and size.

4,311,002

FORMING STRANDED STOCK

Ernst Hoffmann; Friedrich Schatz, both of Langenhagen, and Artur Unger, Lennep, all of Fed. Rep. of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte AG, Hanover, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 944,582, Sep. 21, 1978, abandoned. This application Aug. 29, 1980, Ser. No. 182,492
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1977, 2742662; Oct. 24, 1979, 2942924
Int. Cl.³ H01B *13/04*
U.S. Cl. 57—293 **23 Claims**



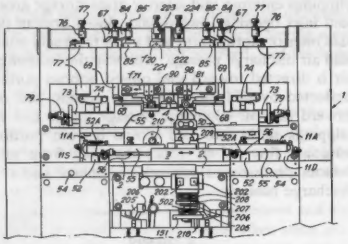
1. Apparatus for stranding elongated stock, comprising:
a plurality of stationarily mounted, reelable support spools storing individual strands to be unwound from the spools upon rotation thereof:
means for combining the strands as unwound in a bundle and for providing a first stranding point through which the bundle passes;
means disposed for positively holding the strands of the bundle as a bundle for a particular travel path as the bundle moves along the travel path together and in engagement with the means for holding, said means for holding stranding the strands together about an axis, but outside the travel path between the means for positively holding and the first stranding point, while stranding does not occur on and along the particular travel path due to said positive holding;
means defining a second stranding point through which the stranded bundle passes by operation of rotation as between the means for positively holding and the second stranding point; and
means for moving the bundle through the first and second stranding points, the means for holding engaging the bundle as so moved through the travel path without stranding a portion of the bundle while on the travel path due to the positive holding.

4,311,003

MACHINE FOR THE FORMATION OF CHAINS WITH LINKS OF TWO TYPES

Ezio Tega, Arezzo, Italy, assignor to Emmegizeta Metalmeccanica Gori & Zucchi M.G.Z. S.p.A., Arezzo, Italy

Filed Feb. 19, 1980, Ser. No. 122,255
Claims priority, application Italy, Mar. 16, 1979, 9368 A/79
Int. Cl.³ B21L *11/00*
U.S. Cl. 59—16 **8 Claims**



1. A machine for the manufacture of chains comprising:
first and second substantially symmetrical machine sections, each of said first and second machine sections including means for operating upon the chain to be formed;
a slide bearing a rotating unit having pincer tools for engaging the links of the chain to be formed, said slide being constructed and arranged to be displaceable between first and second working positions corresponding to said first and second machine sections;
means for displacing said slide;
first and second continuously rotating camshafts corresponding to said first and second machine sections;
tappet means selectively engageable between said means for displacing said slide and said continuously rotating camshafts for transmitting the motion of said camshafts to said displacing means to thereby displace said slide;
locking means to lock said slide at said first and said second positions; and
at least third and fourth camshafts correponding to said first and second machine sections, engagement means engaging between said first and second continuously rotating camshafts and said third and fourth camshafts, respectively, to alternately operate said third and fourth camshafts to thereby alternately actuate said chain operating means in said first and second machine sections.

4,311,004

GAS COMPRESSION SYSTEM AND METHOD

Anthony A. du Pont, Los Angeles, Calif., assignor to Rotoflow Corporation, Los Angeles, Calif.

Filed Oct. 26, 1979, Ser. No. 88,648
Int. Cl.³ F04D *29/10*
U.S. Cl. 60—39.05 **25 Claims**

1. A gas compression system for processing a first gas for use

in a process producing a gaseous product stream, said system comprising:

a plurality of stages operating at successively lower overall pressures, each of said stages including:

at least one fluid handling compressor impeller carried by a rotary shaft for compressing said first gas;

expander means for expanding said gaseous product stream and drivingly connected to said compressor impeller;

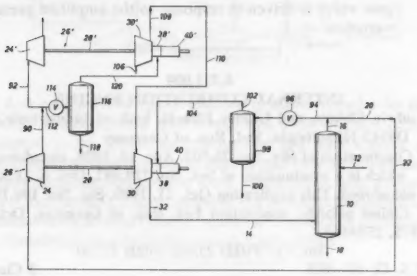
housing means generally surrounding said compressor impeller and the adjacent portion of said shaft;

bearing means axially spaced from said compressor impeller and supporting said shaft in said housing means for rotation;

means for injecting lubricant into said bearing means and causing said lubricant to flow through said bearing means and axially toward said compressor impeller;

seal means surrounding said shaft intermediate said compressor impeller and said bearing means and sealing between said shaft and said housing means;

means for extracting a seal gas inert to said lubricant from said gaseous product stream;



and means for injecting said seal gas into said seal means under a pressure greater than the pressure within said housing between said seal means and said bearing means;

a first of said stages having its compressor outlet communicating with the situs of said process and its compressor intake communicating with the compressor outlet of a second stage of lower overall operating pressure, said first stage further having its expander intake communicating with the situs of said process at a location to receive said gaseous product stream and its expander outlet communicating with the expander intake of said second stage;

and said gas extraction means for said first stage being adapted to extract a portion of said gaseous product stream at a point upstream of the expander of said first stage and separate said seal gas therefrom, and said gas extraction means for said second stage being adapted to extract a portion of said gaseous product stream at a point within or downstream of the expander of said first stage but upstream of the expander of said second stage and separate said seal gas therefrom.

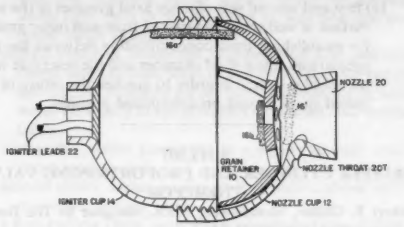
4,311,005

ROCKET MOTOR

Wallace A. Hurd, Jr., Bedford, and Fred R. Youngren, Lexington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 11, 1979, Ser. No. 38,366
Int. Cl.³ F02K *9/14, 9/38*
U.S. Cl. 60—253 **2 Claims**

1. In a rocket motor having a combustion chamber and a nozzle leading from such chamber to form a jet of combustion gases from burning of a solid propellant initially disposed, in the form of a coiled strip, within such chamber, the improvement comprising a perforate shield with a plurality of outwardly extending resilient fingers formed integrally with, and around the periphery of, such shield to frictionally engage the



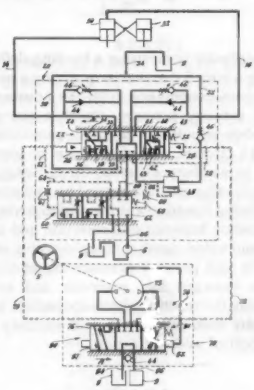
inner wall of the combustion chamber adjacent to the throat of the nozzle thereby to maintain such shield in position between the solid propellant and the nozzle.

4,311,006

PRESSURE COMPENSATED STEERING SYSTEM

Lanson Becker, Galesburg, Mich., assignor to General Signal Corporation, Stamford, Conn.

Filed Oct. 29, 1979, Ser. No. 89,639
Int. Cl.³ F15B *13/042, 13/06*
U.S. Cl. 60—385 **4 Claims**



1. A hydraulic steering control system comprising;

a. a reservoir for storing fluid;

b. a main pump for pressurizing said fluid;

c. a pair of steering cylinders;

d. a multiposition steering control spool valve having a displaceable spool, means for biasing said spool toward a predetermined position, said spool having a plurality of lands for apportioning said pressurized fluid between said steering cylinders in accordance with the position of the spool of said valve as the spool is displaced from said predetermined position;

e. first and second signal fluid chambers disposed one on each end of said spool for receiving pressurized signal fluid to displace said spool from said predetermined position; a rotatable hand pump in fluid communication with said signal fluid chambers for pressurizing one of said chambers in accordance with the rotation of said hand pump, and

f. cancelling means comprising

(i) first and second sets of outer axial grooves in the outer surface of the ends of said spool adjacent to said first

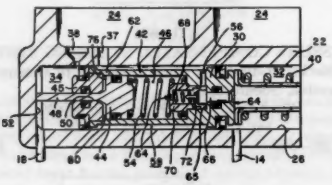
and second signal fluid chambers for establishing fluid communication between a pressurized signal fluid chamber and the reservoir when the spool is displaced from its predetermined position and

(ii) first and second sets of inner axial grooves in the outer surface of said spool and spaced from said outer grooves for establishing fluid communication between the non-pressurized signal fluid chamber and the reservoir when the spool is shifted in order to quicken the return of said biased spool to said predetermined position.

4,311,007
MASTER CYLINDER AND PROPORTIONING VALVE THEREFOR

Robert F. Gaiser, Stevensville, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 1, 1979, Ser. No. 80,823
Int. Cl.³ B60T *11/20*
U.S. Cl. 60—562 **12 Claims**



1. A master cylinder comprising a housing defining a reservoir and having a bore for movably receiving a pair of pistons, said pair of pistons cooperating with the housing to substantially define a primary pressure chamber and a secondary pressure chamber which are in fluid communication with respective brake circuits, one of said pair of pistons substantially defining an auxiliary chamber for movably receiving a reaction piston, a valve member carried by said one piston, said valve member being biased to a first position normally opening fluid communication between said reservoir and said auxiliary chamber, and said valve member being movable in response to fluid pressure in said primary pressure chamber to close the communication between said reservoir and said auxiliary chamber whereby the reaction piston cooperates with said one piston to increase fluid pressure in said auxiliary chamber to oppose movement of said one piston.

4,311,008
EXHAUST BYPASS TYPE TURBO-CHARGER

Koichiro Yamada, Ibaraki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 2, 1980, Ser. No. 109,113
Claims priority, application Japan, Jan. 10, 1979, 54-678
Int. Cl.³ F02B *37/00*
U.S. Cl. 60—602 **6 Claims**

1. An exhaust bypass type turbo-charger comprising:

a turbine driven by an exhaust gas introduced from an internal combustion engine into the interior of said turbine through an exhaust introduction passage;

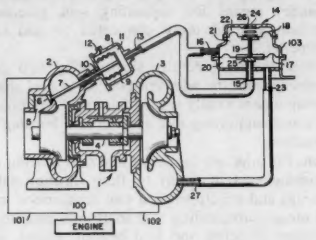
a compressor operatively connected to said turbine so as to be driven by said turbine, said compressor communicating with said engine through a discharge passage to supply air into said engine;

an exhaust bypass passage communicating with said exhaust introduction passage for causing a portion of exhaust gas from said engine to bypass said turbine;

an exhaust bypass valve for controlling an amount of exhaust gas passing through said exhaust bypass passage;

a drive mechanism operatively connected to said exhaust bypass valve for driving said exhaust bypass valve in response to the pressure introduced in said drive mechanism; and

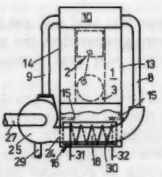
a transducer fluidly communicating with both said discharge passage and interior of said drive mechanism for amplifying the pressure variation in said discharge passage and introducing the pressure amplified in its variation into the interior of said drive mechanism so that said exhaust bypass valve is driven in response to the amplified pressure variation.



4,311,009
INTERNAL COMBUSTION ENGINE

Ludwig Elsbett, and Günter Elsbett, both of Industriestr. 14, D8543 Hilpoltstein, Fed. Rep. of Germany

Continuation of Ser. No. 28,903, Apr. 11, 1979, abandoned, which is a continuation of Ser. No. 729,942, Oct. 6, 1976, abandoned. This application Oct. 21, 1980, Ser. No. 199,196
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1975, 2544813
Int. Cl.³ F02D *23/00*; F02B *37/00*
U.S. Cl. 60—605 **3 Claims**



1. A diesel cycle internal combustion engine having a plurality of cylinders arranged in a row in an engine block wherein pistons reciprocate in the cylinders and rotate a crankshaft positioned beneath the pistons, said engine including intake and exhaust ports connected to each cylinder on opposite sides thereof via a cylinder head and an oil pan positioned beneath the block and crankshaft; the improvement characterized by:

intake manifold means having branches connected at one end to the intake ports and connected at the other end to intake trunk means wherein the intake manifold means and intake trunk means extend downwardly adjacent to the block toward said oil pan and wherein the lengths and configuration of the branches are matched to provide substantially equal volumns of intake air for each cylinder when the engine is running;

an air container having two ends, being connected at one end to the first trunk means and passing through the oil pan;

a turbocharger located adjacent to the oil pan and connected to the other end of the air container, and

exhaust manifold means having branches connected at one end to the exhaust ports and connected at the other end to exhaust trunk means wherein the exhaust branch means and exhaust trunk means extend downwardly adjacent to

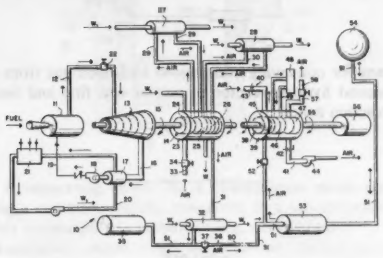
the engine block toward said oil pan with the exhaust branch means connected to the turbocharger for driving the turbocharger.

4,311,010

GAS-POWERED ENGINE ADAPTED TO UTILIZE STORED SOLAR HEAT ENERGY AND COMPRESSED GAS POWER SYSTEM

Charles J. Wurmfeld, 401 E. 65th St., New York, N.Y. 10021

Filed Dec. 5, 1978, Ser. No. 966,623
Int. Cl.³ F01K *25/10*
U.S. Cl. 60—641.8 **21 Claims**



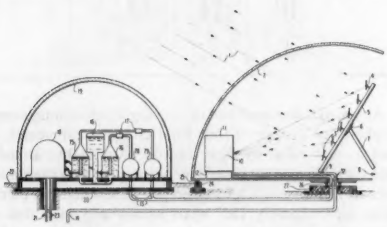
1. A gas-powered engine adapted to utilize stored solar heat energy in atmospheric fluid comprising a turbine, said turbine adapted to be driven by compressed gas, said driving gas decompressable in driving to reduce said turbine temperature below ambient atmospheric fluid temperature, and means to flow atmospheric fluid at ambient atmospheric temperature in contact with said gas turbine, whereby heat energy in said fluid is transferred to said driving gas in said turbine.

4,311,011

SOLAR-WIND ENERGY CONVERSION SYSTEM

Arlin C. Lewis, Box AU, Libby, Mont. 59923

Filed Sep. 26, 1979, Ser. No. 79,009
Int. Cl.³ F03G *7/02*
U.S. Cl. 60—641.15 **12 Claims**



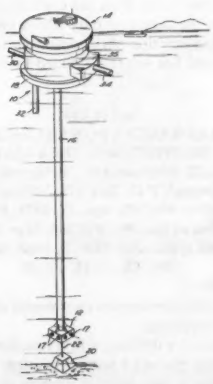
1. A solar energy conversion system comprising:
boiler means for producing steam in response to solar energy;
means for directing solar rays towards a predetermined portion of said boiler means;
a primary steam storage tank for storing steam produced by said boiler means;
a first water storage tank;
a second water storage tank positioned beneath said first water storage tank;
first and second lower steam storage tanks;
valve means for selectively coupling said primary steam storage tank to one of said first and second lower steam storage tanks;
first and second water pumping tanks, said first and second water pumping tanks being respectively coupled to said first and second lower steam storage tanks;
first coupling means for coupling said first and second lower steam storage tanks to said second water storage tanks, said first coupling means having means for permitting water flow only in the direction of said first and second lower steam storage tanks;
second coupling means for coupling said first and second lower steam storage tanks to said first water storage tanks, said second coupling means having means for permitting water flow only in the direction of said first water storage tank;
first pulley means positioned in a region beneath said first water storage tank;
second pulley means positioned in a region above said second water storage tank;
a first endless chain member running between said first and second pulley means;
a plurality of bucket means coupled to said chain member at spaced intervals;
water spout means for moving water from said first water storage tank to said bucket means in the vicinity of said first pulley means;
said second water storage tank having an aperture in the upper portion thereof for receiving water from said bucket means;
a second endless chain member coupled to said second pulley means; and
an electrical generator, said second chain member being coupled to provide input operating power to said electrical generator.

4,311,012

METHOD AND APPARATUS FOR TRANSFERRING COLD SEAWATER UPWARD FROM THE LOWER DEPTHS OF THE OCEAN TO IMPROVE THE EFFICIENCY OF OCEAN THERMAL ENERGY CONVERSION SYSTEMS

Warren T. Finley, 10352 Miralago Pl., Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 931,675, Aug. 7, 1978, Pat. No. 4,189,379, which is a continuation-in-part of Ser. No. 833,939, Sep. 16, 1977, abandoned. This application Feb. 19, 1980, Ser. No. 122,301
Int. Cl.³ F03G *7/04*
U.S. Cl. 60—641.7 **10 Claims**



1. In an ocean thermal energy conversion plant having a heat cycle engine system which operates on the temperature differential between the upper and lower depths of the ocean, a method of efficiently transporting the lower depth seawater upward to said heat cycle engine system, comprising:
submerging conduit means into said ocean to extend from

said lower depth upward to said heat cycle engine system; and

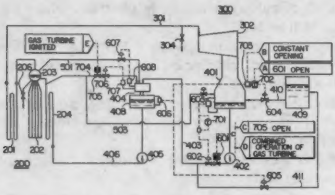
at least partially desalinating the seawater at said lower depth to reduce the density of said seawater, so that said desalinated seawater naturally rises upward within said conduit means to said heat cycle engine system.

4,311,013

METHOD OF CONTROLLING CONDENSATION SYSTEM OF STEAM PLANT

Tetsuzo Kuribayashi, and Hiroshi Tsunematsu, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 26, 1980, Ser. No. 124,960
Claims priority, application Japan, Feb. 27, 1979, 54/23881
Int. Cl.³ F01K *13/02*
U.S. Cl. 60—646 **4 Claims**



1. A method of controlling a condensation system of a steam plant wherein a steam system comprises a boiler, a load doing work with steam generated by the boiler, and a condenser for condensing steam that has done work to produce condensate, and the condensation system comprises a deaerator for heating and deaerating the condensate by at least a portion of steam or hot water obtained from the steam system, and a feed water pump for feeding the deaerated condensate to the boiler, such method comprising the steps of:

starting the boiler by feeding thereto water retained in a deaerator water tank attached to the deaerator and storing the condensate returned through the boiler in at least one of the condenser and a condensate tank to cease the feeding of the condensate to the deaerator at plant start-up; and

feeding the condensate from the condenser and the condensate tank to the deaerator only after a predetermined level of deaerating function of the deaerator is ensured by using the steam and hot water produced by the boiler.

4,311,014

POWER CYCLES BASED UPON CYCLICAL HYDRIDING AND DEHYDRIDING OF A MATERIAL

Lynn E. Terry, 22 Suncrest Ave., Bridgeton, N.J. 08302, and Roger J. Schoeppel, P.O. Box 971, Stillwater, Okla. 74074

Division of Ser. No. 900,769, Apr. 27, 1978, Pat. No. 4,198,827, which is a division of Ser. No. 666,786, Mar. 15, 1976, Pat. No. 4,090,361. This application Mar. 3, 1980, Ser. No. 126,378
Int. Cl.³ F01K *25/10*
U.S. Cl. 60—649 **3 Claims**

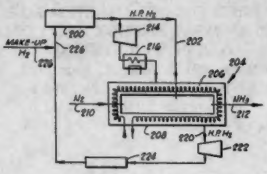
1. Apparatus for carrying out exothermal chemical reactions of hydrogen comprising:

a hydrogen reactor defining a first reaction zone for receiving hydrogen gas and a second reactant reactive with the hydrogen gas in said reaction zone in an exothermal reaction;

a first hydride reactor containing a hydridable material in a second reaction zone positioned adjacent said first reaction zone, and in heat exchange relation thereto, for heating said hydridable material with the heat of reaction evolved in said exothermal reaction occurring in said first reaction zone;

conduit means for conveying said second reactant to said first reaction zone;

a second hydride reactor containing a hydridable material for producing compressed hydrogen gas; and



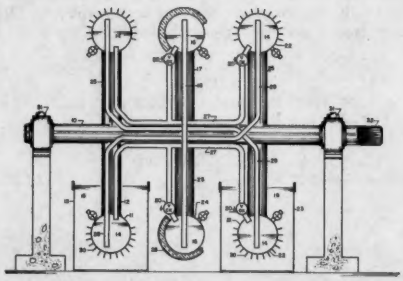
means for conveying compressed hydrogen gas from said second hydride reactor to one of said first and second reaction zones.

4,311,015

CARNOT CYCLE HEAT OPERATED MOTOR

Rudolph Rust, 8192 Deerfield Dr., Huntington Beach, Calif. 92646

Filed Jan. 4, 1980, Ser. No. 109,667
Int. Cl.³ F01K *7/00*
U.S. Cl. 60—675 **2 Claims**

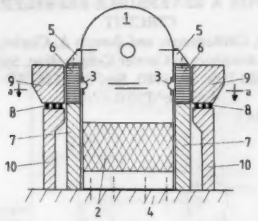


1. An apparatus comprised of two liquid containing sumps, a multiplicity of groups of four fluid containment vessels connected to each other by fluid transfer tubes and to an axle by spokes with the axle supported by bearings so that the shaft can rotate, with the vessels located in pairs such that the pairs are located approximately 180° apart axially and such that each member of one pair is located at approximately an equal longitudinal distance along the shaft from a corresponding member of the other pair; each group of vessels with approximately the same longitudinal location on the shaft constituting a wheel located in relation to the sump so the vessels are alternately immersed and lifted out as the axle rotates, the sump under one wheel being relatively hotter than the one under the other wheel, each group of four vessels containing a binary mixture of miscible liquids having vapor pressure intermediate between the vapor pressure of the pure components and a transfer tube arrangement such that the vapor pressure in the heated vessel drives the liquid phase from lower vessels into the upper vessels in a criss-cross pattern, the liquid from the hot wheel going to the cold wheel and the liquid from the cold wheel going to the hot wheel, the resulting unbalance causing rotation of the axle which continues due to the alternate heating and cooling of the fluid as it rotates.

4,311,016
SUPPORTING DEVICE

Günter Kaelber, Birmenstorf, Switzerland, assignor to BBC Brown Boveri & Company, Limited, Baden, Switzerland

Filed Oct. 17, 1979, Ser. No. 85,737
Claims priority, application Switzerland, Oct. 30, 1978, 200270/78
Int. Cl.³ F01B 31/06
U.S. Cl. 60—687 5 Claims



1. A supporting device for a condensation steam turbine having a condenser rigidly connected to a sub-structure and flexibly connected to a turbine casing, comprising:

a foundation carrier which supports only turbine parts exposed to vacuum tension;

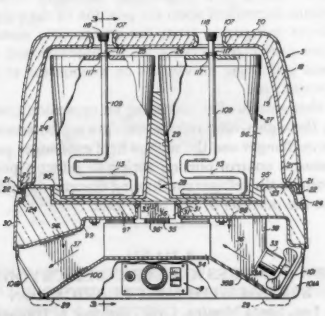
a support which connects said foundation carrier with the sub-structure; and

a spring supported foundation within which said foundation carrier is arranged, said foundation supporting the rest of the turbine.

4,311,017
THERMOELECTRIC JUG COOLER

Kingstone L. H. Reed; William Danchuk, and Ian Hatcher, all of Barrie, Canada, assignors to Koolatron Industries, Inc., Barrie, Canada

Filed Mar. 26, 1980, Ser. No. 134,172
Int. Cl.³ F25B 21/02; F25D 3/08
U.S. Cl. 62—3 15 Claims



1. A thermoelectric apparatus for changing the temperature of a quantity of liquid from a first temperature to a second temperature, said thermoelectric apparatus comprising in combination:

(a) a first container for containing the quantity of liquid, said first container having a top;

(b) thermally conductive support means for receiving and supporting a bottom of said first container, said thermally conductive support means being shaped to closely contact substantially the entire bottom surface of said first container in order to minimize thermal resistance between said container and said thermally conductive support means;

(c) base means for supporting said thermally conductive support means, said base means having first and second side walls having first and second holes therein, respectively;

(d) a removable cover disposed on said base means for cooperating with said base means to bound and thermally insulate a region in which said first container is disposed;

(e) an elongated duct disposed in said base means, said duct extending from said first opening to said second opening to allow air to pass through said duct and said first and second holes;

(f) a heat exchanger disposed in said duct, said heat exchanger including a plurality of spaced fins disposed such that substantially all air passing through said duct must pass between various ones of said fins;

(g) electric fan means disposed in said duct for forcing air to flow through said duct and said first and second holes;

(h) thermoelectric means for effecting flow of thermal energy between said heat exchanger and said thermally conductive support means to cause the temperature of the liquid to change from the first temperature to the second temperature;

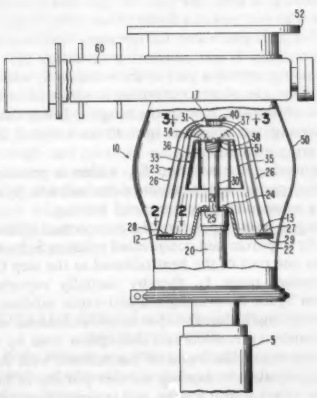
(i) valve means for controllably conducting fluid through a lower portion of the wall of said container and through a portion of said thermoelectric apparatus adjacent to said lower portion of the wall of said container while said cover means is disposed on said base means;

whereby the fluid can be dispensed from said thermoelectric apparatus without use of a pump due to the action of gravity and without requiring removal of said cover from said base means.

4,311,018
CRYOGENIC PUMP

Kimo M. Welch, Mountain View, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 104,214, Dec. 17, 1979, abandoned.
This application Sep. 22, 1980, Ser. No. 189,524
Int. Cl.³ F25D 5/00
U.S. Cl. 62—55.5 21 Claims



1. A cryogenic pumping apparatus comprising:

a first-stage expansion chamber to accommodate expansion of a refrigerant gas whereby a portion of said first-stage expansion chamber can be maintained at a first temperature;

a second-stage expansion chamber to accommodate a further expansion of said refrigerant gas whereby a portion of said second-stage expansion chamber can be maintained at a

second temperature, said second temperature being lower than said first temperature;

a first-stage pumping structure in intimate thermal contact with said first-stage expansion chamber;

a second-stage pumping structure in intimate thermal contact with said second-stage expansion chamber;

said first-stage pumping structure comprising an array of baffles, the baffles of said array being spaced apart from each other and arranged to form a wall around said second-stage pumping structure, said wall preventing line-of-sight transmission of radiation to said second-stage pumping structure, gas conductance to said second-stage pumping structure being permitted uniformly through said wall via spaces between adjacent baffles of said array.

4,311,019

PROCESS FOR PRODUCING COLD AND/OR HEAT WITH USE OF AN ABSORPTION CYCLE

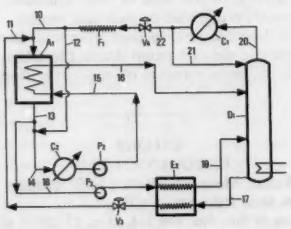
Alexandre Rojey, Garches, and Georges Cohen, Le Pecq, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 17, 1980, Ser. No. 141,248

Claims priority, application France, Apr. 17, 1979, 79 09836

Int. Cl.³ F25B *15/00, 27/02, 13/00*

U.S. Cl. 62—101 **24 Claims**



1. A process for producing cold and/or heat, which comprises the following steps of:

(a) contacting at least one part of a gas phase comprising a solute with one part of a liquid phase comprising a solvent, in a first absorption step for releasing heat in a first temperature range I_1 and recovering a solution S_1,

(b) contacting at least a part of the solution S_1 with another part of the gas phase comprising a solute in at least one second absorption step, in the range I_2 lower than I_1, for transferring the liberated heat to an external fluid and recovering a solution S_2,

(c) compressing the solution S_2, within a pressure range allowing partial vaporization of the solution S_2 resulting from a subsequent predetermined heating,

(d) heating at least one part of the compressed solution S_2 to partially vaporize said compressed solution S_2 by applying at least one part of the heat released in the step (a) in the temperature range I_1, thereby partially vaporizing the solution S_2 for recovering a liquid-vapor mixture,

(e) fractionating the liquid-vapor mixture obtained in step (d) in a counter-current contact desorption zone by contacting a portion of the liquid of the mixture with the vapor phase generated by heating another portion of the liquid with an external heat source, and separately recovering an enriched gas phase of solute and an impoverished liquid phase of solute,

(f) condensing the gas phase of solute recovered in step (e) by transferring the condensation heat to an external fluid thereby recovering a condensate,

(g) expanding the recovered condensate in at least one step and vaporizing at least a portion of resultant expanded condensate to produce cold, and transmitting said cold to an external fluid, thereby recovering at least one gas phase of solute and feeding at least one part thereof to the step (a), and

(h) expanding the impoverished liquid phase of solute recovered in step (e) and feeding it back at least in part to the step (a) for being contacted again with at least one part of the gas from the step (g).

4,311,020

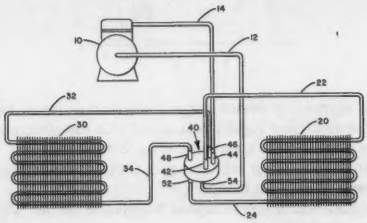
COMBINATION REVERSING VALVE AND EXPANSION DEVICE FOR A REVERSIBLE REFRIGERATION CIRCUIT

Curtis L. Tobin, Chittenango, and Joseph A. Ciarlei, Brewerton, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 29, 1980, Ser. No. 126,057

Int. Cl.³ F25B *13/00*

U.S. Cl. 62—324.6 **6 Claims**



1. A reversible refrigeration circuit which comprises:

compressor means;

a first heat exchanger;

a second heat exchanger;

a valve assembly;

interconnecting means joining the compressor means, the first heat exchanger, the second heat exchanger and the valve assembly to form a closed circuit; and

said valve assembly including

a housing adapted to be connected to the compressor, first heat exchanger and second heat exchanger,

a movable valve gate mounted within the housing, said gate having a first position including flow control means dependent upon the position of the valve gate to direct refrigerant from the compressor means to the heat exchanger serving as a condenser and from the heat exchanger serving as an evaporator to the compressor; and

said valve gate further including an expansion control portion through which refrigerant flowing between the first heat exchanger and the second heat exchanger passes, said expansion control portion acting to effect a pressure reduction in the refrigerant flowing therethrough dependent upon the position of the valve gate.

4,311,021

SCREW COMPRESSOR-EXPANDER CRYOGENIC SYSTEM WITH MIST LUBRICATION

Bruno S. Leo, Santa Monica, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation-in-part of Ser. No. 894,677, Apr. 10, 1978, abandoned. This application Dec. 10, 1979, Ser. No. 102,305

Int. Cl.³ F25D *9/00*

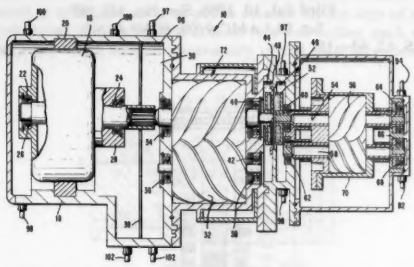
U.S. Cl. 62—402 **6 Claims**

1. A closed cycle refrigeration system comprising:

a screw compressor having a housing having a chamber therein, an inlet and an outlet in said housing and in communication with said chamber, first and second compressor rotors rotatably mounted on bearings, said rotors being within said compressor chamber in said compressor housing, said first and second rotors respectively having intermeshing lobes and recesses and configured so that

compression occurs in gas passing through said compressor;

an expander having an expander housing, an expander chamber within said housing, an inlet and outlet on said expander housing, first and second expander rotors rotatably mounted on bearings and positioned within said expander chamber and said expander housing, said first and second rotors having intermeshing lobes and recesses so that gas expansion takes place in gas passing through said expander upon rotation of said expander rotors in said expander housing;



means interconnecting said inlet and said outlet on said compressor housing and said inlet and said

outlet on said expander housing for providing a closed system for the circulation of refrigerant gas therein, for rejecting heat and for receiving heat for producing refrigeration upon rotation of said rotors; and

at least one closed lubricant circulation loop separate from said refrigerant gas closed system connected to deliver lubricant past some of said bearings, said lubricant loop having a blower therein for circulating an oil mist and gas lubrication fluid to said bearings connected to said loop.

4,311,022

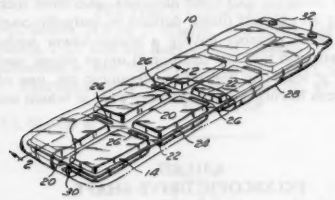
FOLDABLE ICE PACK

John M. Hall, 7234 Bahn Blvd., Anderson, Calif. 96007

Filed Apr. 18, 1980, Ser. No. 141,628

Int. Cl.³ F25D *3/08, 3/10*

U.S. Cl. 62—457 **5 Claims**



1. A foldable ice pack comprising:

a plurality of separate compartments, each said compartment to contain a refrigerant;

a webbing assembly innerconnecting said compartments, said webbing assembly including a single thin webbing strip located between each connected pair of said compartments;

each said compartment being enclosed by a wall assembly, said wall assembly comprising an inner layer of sheet material which is overlapped with an outer layer of sheet material, a slight air space is formed between said inner layer and said outer layer, said air space is to function as insulation retarding the accumulation of moisture on the exterior surface of said outer layer;

an additional layer of sheet material located about said outer layer, a second air space formed between said additional layer and said outer layer, said second air space to function as insulation further retarding the accumulation of moisture on the exterior surface of said additional layer; and

a drain opening formed within said additional layer, whereby any moisture accumulated within said second air space to be discharged to the ambient through said drain opening.

4,311,023

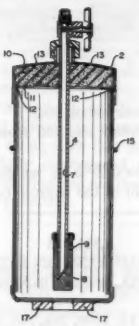
AIR CONDITIONING SERVICING APPARATUS

James P. Watral, 3 Ann Ave., Twin Oaks, Mo. 63088

Filed May 15, 1980, Ser. No. 150,156

Int. Cl.³ F25B *43/02*

U.S. Cl. 62—468 **17 Claims**



1. An air conditioning servicing apparatus principally for use in conjunction with an automobile, or the like, air conditioning system of the type which includes a charge of refrigerant and lubricant materials, comprising, a container of appreciable capacity for holding at least the quantity of lubricant normally added to the aforesaid type of air conditioning system, an upper closure member for the container, and an upper portion for the container, said closure member connecting upon said upper portion of the container, said upper portion of the container having at least one vent opening therethrough for allowing the escape of gaseous refrigerant being released from the aforesaid type of system while capturing the discharging lubricant material, a filter provided within said upper portion of the container to filter the release of the said type of refrigerant, a flow tube extending down the container, said closure member having an aperture therethrough and with the flow tube being located through said aperture, whereby the flow tube communicated with the aforesaid type of air conditioning system for accomodating the discharge of any refrigerant and lubricant to the container where the lubricant may be collected and the gaseous refrigerant be released through its upper disposed filter to the atmosphere.

4,311,024

HERMETICALLY CIRCULATING, ABSORPTION TYPE REFRIGERATOR

Masahiko Itoh, Hitachiota; Heihatiro Midorikawa, and Akira Minato, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 17, 1979, Ser. No. 104,469

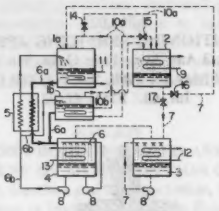
Claims priority, application Japan, Dec. 25, 1978, 53-158566

Int. Cl.³ F25B *43/00*

U.S. Cl. 62—474 **15 Claims**

1. A hermetically circulating, absorption type refrigerator based on a closed circulation system of constituent members comprised of a successive communication of a regenerator, a condenser, an evaporator, an absorber and a heat exchanger, parts or the whole of said constituent members in contact with

an absorbing solution being comprised of steel and a copper material selected from copper and copper alloy, and refrigeration being produced by repetitions of concentration, refrigerant dilution, and heat exchange of an aqueous concentrated lithium bromide solution sealed in the circulation system, characterized in that said absorbing solution contains the following compounds (a) and (b) for function as a corrosion inhibitor:



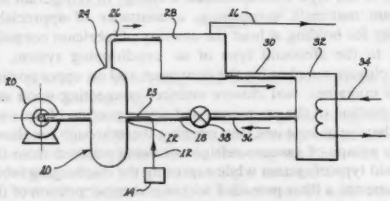
(a) a nitrate of an alkali metal, and
(b) a triazole compound selected from benzotriazole and tolyltriazole

in an amount of 0.01 to 0.05% by weight of the nitrate and 0.005 to 0.1% by weight of the triazole compound.

4,311,025
GAS COMPRESSION SYSTEM

Warren Rice, Tempe, Ariz., assignor to Natural Energy Systems, Tempe, Ariz.

Filed Feb. 15, 1980, Ser. No. 121,666
Int. Cl.³ F25B *1/00*; F04F *11/00*
U.S. Cl. 62—502 **6 Claims**

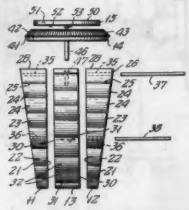


1. Apparatus for compressing a gaseous medium, said apparatus comprising in combination:
(a) a source of the gaseous medium;
(b) a liquid medium for entraining the gaseous medium, said liquid medium being non-miscible with the gaseous medium;
(c) a sparger for distributing the gaseous medium within said liquid medium to entrain the gaseous medium in said liquid medium;
(d) a multiple disc compressor for compressing said liquid medium and the entrained gaseous medium, said compressor including an inlet in communication with said sparger for receiving said liquid medium and the entrained gaseous medium and an outlet for discharging said pressurized liquid medium and the entrained gaseous medium, said compressor including:
(i) means for applying power to said compressor to rotate said compressor;
(ii) means for varying the compression of said liquid medium and entrained gas medium and regulating the speed of rotation of said compressor; and
(iii) means for varying the ratio of the gaseous medium to said liquid medium;
(e) a separator in fluid communication with said outlet for separating the pressurized gaseous medium from said liquid medium;
(f) means for withdrawing heat from said liquid medium; and
(g) means for reducing the pressure of said liquid medium and for returning said liquid medium to said sparger.

4,311,026
COMPOSITE FINGER RING AND METHOD OF MAKING SAME

Enrique J. Ochoa, Palm Beach, Fla., assignor to Jewelmasters, Inc., Palm Beach, Fla.

Filed Jul. 10, 1980, Ser. No. 168,207
Int. Cl.³ A44C *9/00*; B23P *11/00*
U.S. Cl. 63—15 **3 Claims**



1. A composite finger ring comprising: first and second outer band members, each bounded by inner and outer end surfaces and a decorative peripheral surface simulating individual links in a watchband, the peripheral surface of either of said outer members presenting the simulated individual links symmetrically disposed to the other; a single centrally disposed band member positioned between the inner surfaces of said first and second outer band members, said inner band member including opposed parallel end surfaces and a peripheral decorative surface simulating individual links in a watchband, the simulated individual links of said inner band being disposed in staggered configuration relative to that of said first and second outer members so that the band members will present, in composite, the appearance of such watchband; each of said first, second and single band members having aligned transversely extending bores, and alignment pin means engaging said bores whereby to integrate said band members, said band members each having an exposed planar surface in mutually co-planar relation; a bezel member having a planar lower surface in abutted relation to said last mentioned upper planar surfaces, and having at least one depending alignment pin, one of said upper surfaces having a corresponding bore in which said pin is engaged.

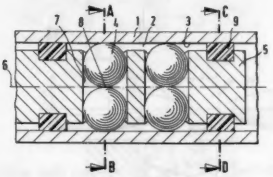
4,311,027
TELESCOPIC DRIVE SHAFT

Werner Krude, Neunkirchen, Fed. Rep. of Germany, assignor to Uni-Cardan Aktiengesellschaft, Seigburg, Fed. Rep. of Germany

Filed Sep. 27, 1979, Ser. No. 79,370
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1978, 2843935
Int. Cl.³ F16D *3/06*
U.S. Cl. 64—23.7 **5 Claims**

1. Telescopic drive shaft comprising an axially elongated tubular outer shaft member, an inner shaft member located within said outer shaft member and being displaceable therein in the axial direction of said outer shaft member, said outer shaft member and inner shaft member being rotatable about the axis of said outer shaft member, said inner shaft member having axially extending bores extending perpendicularly of the axis of said outer shaft member, the inner surface of said outer shaft member having grooves therein extending in the axial direction of said outer shaft member, torque transmitting elements

positioned within said cross bores and at least certain of said torque transmitting elements extending radially outwardly from said cross bores into engagement within said grooves for effecting torque transmission between said outer and inner shaft members, wherein the improvement comprises that said bores in said inner shaft member extend diametrically therethrough and open from opposite sides of said inner shaft member, the axes of said bores in said inner shaft member are disposed in parallel relation and are spaced apart in the axial direction of said inner shaft member, said torque transmitting elements are roll bodies with at least two said roll bodies positioned in each said cross bore with the surfaces thereof disposed in rolling contact at points located on the axis of said cross bores containing said at least two roll bodies, each said roll body being shaped transversely of the axial direction of



said cross bore so that said roll body contacts the surface of said cross bore in rolling contact therewith, recesses are formed in the outer surfaces of said inner shaft member on the opposite sides of and spaced in the axial direction of said inner and outer shafts from said bores in said inner shaft member, the surfaces of said recesses facing outwardly toward said outer shaft are planar, said recesses located in opposed facing relation to said grooves in said outer shaft, and plastic elements seated within said recesses and extending outwardly therefrom into sliding surface contact with said grooves for axially guiding said inner shaft member within said outer shaft member, the surface of said plastic elements in said grooves conforming to the surface of said grooves and the surface of said plastic elements within said recesses conforming to and disposed in surface contact with the planar surfaces in said recesses.

4,311,028

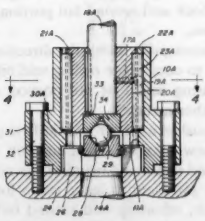
FLEXIBLE COUPLINGS

Peter S. Brown, R.F.D. 2, Warren, Me. 04864, and Samuel H. Tibbetts, P.O. Box 82, Rockport, Me. 04856

Continuation of Ser. No. 861,683, Dec. 19, 1977, abandoned. This application Nov. 26, 1979, Ser. No. 97,305

Int. Cl.³ F16D *3/58*

U.S. Cl. 64—28 R **10 Claims**



1. A flexible coupling for use in connecting drive and driven elements, said coupling including a first member attachable to one element and having an axial chamber having first and second ends and open at least at its first end, a second member having first and second ends, said second member attachable to the other element and dimensioned to be freely rotatable within said axial chamber and provide a substantial annular clearance between the periphery of the second member and said chamber, said second member entrant into said chamber through the open end of said first member and spaced inwardly in said chamber from the second end of the first member, the interior of said first member and the exterior of said second member each having a series of the same number of channels corresponding ones of said series aligned to provide lengthwise passages, a plurality of elastomeric splines, one for each passage and extending lengthwise of and confined therein, the diameter of said splines such as to be a substantially uncompressed fit in said passages, the channels and splines providing the sole driving connections between the members with the driving torque exerted by one member applied diagonally through the splines from the driving margins of one series of channels to the diagonally opposite channel margins, said splines being resiliently compressed from end-to-end by driving torque and also by angular misalignment forces and accommodative of such forces until fully compressed, and stop means on both the first and second member closing opposite ends of the channels of the said first and second member the length of said splines such that the ends of the splines are in engagement with the corresponding stops and hold said second member from the second end of said first member, said splines having a selected durometer rating such that they become increasingly compressed until fully compressed when a predetermined maximum torque is exerted and are then subject to shear if that maximum torque is exceeded.

4,311,029

DATA ENTRY DEVICE FOR A FLATBED KNITTING MACHINE WITH ELECTRONIC CONTROL

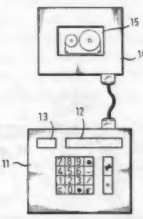
Werner Sommer, Westhausen; Hans Schieber; Erich Krause, both of Bopfingen; Franz Radel, Westhausen; Werner Trümper, Bopfingen; Henning Rieche, Lauchheim; Dieter Tollkühn, Bopfingen; David Retallick, Gillching; Albin Weingartner, Munich, and Peter R. Doslik, Stuttgart, all of Fed. Rep. of Germany, assignors to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG, Fed. Rep. of Germany

Filed Feb. 12, 1980, Ser. No. 120,805

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1979, 2905240

Int. Cl.³ D04B *7/00*

U.S. Cl. 66—75.2 **14 Claims**



1. In a knitting machine having electronic control, memory and control units associated with the machine, a data entry device for the entering of data into the machine, and also indicator means, wherein upon the entering of data by way of the data entry device the indicator means provides a guidance report for the user, data called up for entry can be directed to one of several types of machine, each next step in the entry of data can only be effected in accordance with the requirement shown by the indicator means, and at least one key is provided for stepping-on the indicator means, the improvement wherein the data entry device has only one keyboard with ten number keys, a decimal point key, an erase key, a needle selection key, a needle selection suppression key, a slash key, an initial recall key, a YES key and a NO key, a digital instruction display, and a digital program display, in which for the entry of pattern information five program segments with independent entry

possibilities are provided fixedly in the entry device, in which the data entry device itself includes a permanently connected program for strict user guidance beginning with the choice of the type of machine and of the mode of operation (writing, editing, reading, automonitoring), and in which each time the NO key for the stepping-on of the instruction display is activated it is only effective in respect of the displayed step.

4,311,030

METHOD AND APPARATUS FOR CONTROLLING TEMPER-ROLLED PROFILE OF COLD ROLLED STEEL STRIP AFTER CONTINUOUS ANNEALING

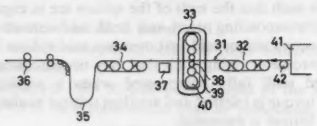
Satoyuki Kitashima, and Norichika Nagira, both of Kitakyusyu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 11, 1979, Ser. No. 102,346

Claims priority, application Japan, Dec. 14, 1978, 53-153626

Int. Cl.³ B21B *37/00, 1/28, 31/18*

U.S. Cl. 72—8 **5 Claims**



1. A method for controlling a temper-rolled profile of a cold rolled steel strip after continuous annealing, comprising subjecting the continuously annealed cold rolled steel strip simultaneously to temper-rolling and profile controlling by use of a six-high rolling mill of intermediate roll shifting type in the same production line.

4,311,031

PIPE BENDING MACHINE

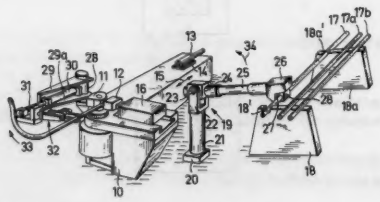
Rigobert Schwarze, Olpener Str. 460-474, 5000 Köln, Fed. Rep. of Germany

Filed Jul. 20, 1979, Ser. No. 59,762

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1978, 2832980

Int. Cl.³ B21D *7/04, 9/05, 43/10, 43/20*

U.S. Cl. 72—133 **8 Claims**



1. In a pipe bending machine, a combination comprising pipe bending means for bending pipes, said pipe bending means being movable between an open position and a pipe clamping and bending position; a pipe magazine spaced laterally from one side of the pipe bending means; pipe transfer means interposed between said pipe magazine and said pipe bending means for transferring pipes from said magazine to said pipe bending means while the latter is in said open position, said pipe transfer means being pivotable in a plurality of mutually inclined planes; and pipe removal means laterally adjacent to an opposite side of said pipe bending means for gripping a bent pipe in said pipe bending means while the latter is in said pipe clamping and bending position and for removing the bent pipe from said pipe bending machine when the latter is in said open position, said pipe removal means also being movable in a plurality mutually inclined planes.

4,311,032

METHOD AND APPARATUS FOR ROLLING SEAMLESS TUBES WITH A RESTRAINED MANDREL

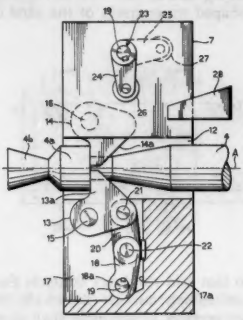
Aurindo Nessi, Albate, Italy, assignor to Innocenti Santeustacchio S.p.A., Brescia, Italy

Filed Jan. 18, 1980, Ser. No. 113,276

Claims priority, application Italy, Feb. 7, 1979, 19980 A/79

Int. Cl.³ B21B *17/04*

U.S. Cl. 72—208 **6 Claims**



1. In a method of operating a continuous rolling mill having a plurality of successive roll stands, equipped with a mandrel-restraining crosspiece and a roller conveyor at the input of the rolling mill for the support and guidance of a mandrel/billet unit comprising a mandrel having mounted thereon a pierced billet to be advanced between the rolls of the rolling mill for the production of seamless tubes, the improvement comprising the steps of:

locking a first tail portion of said mandrel to a pusher member which is movable along the direction of the rolling axis of said rolling mill, from a first position to a second position along the length of said roller conveyor,

advancing said mandrel/billet unit towards said rolling mill along said roller conveyor until said billet is at the input of the first roll stand of said rolling mill,

locking a second tail portion of said mandrel, spaced from the said first portion, into a recess in said restraining crosspiece of said rolling mill, said recess extending parallel to said rolling axis, having transverse dimensions such as to permit the passage of said mandrel/billet unit therethrough, and having retractable locking means which are advanced to lock said second tail portion of said mandrel into said recess,

advancing said crosspiece along the direction of said rolling axis whereby to commence rolling said billet, and simultaneously releasing said first tail portion of said mandrel from said pusher member,

returning said pusher member to said first position thereof,

positioning a new mandrel/billet unit on said roller conveyor after said restrained mandrel has moved therealong by a distance sufficient to leave room for said new mandrel/billet unit, releasing said second tail portion of said mandrel from said crosspiece at the end of the rolling operation whereby said mandrel/billet unit, now rolled, passes from said rolling mill, and

returning said crosspiece to the initial position thereof, said crosspiece passing over said new mandrel/billet unit during its return movement without interference due to said recess in said crosspiece passing over said new mandrel/billet unit with said locking means being retracted.

4,311,033

ROLLING MILL ROLL AND METHOD OF ROLLING

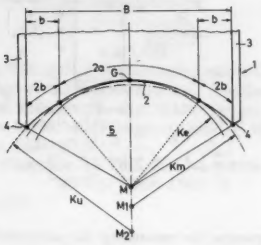
Werner Demny, and Hermann Möltner, both of Düsseldorf-Oberkassel, Fed. Rep. of Germany, assignors to Kocks Technik GmbH & Co., Düsseldorf, Fed. Rep. of Germany

Filed Aug. 6, 1979, Ser. No. 63,999

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1979, 2844042

Int. Cl.³ B21B *17/00, 27/00*

U.S. Cl. 72—224 8 Claims



1. In a rolling mill roll for the reduction and stretch-reduction of tubes having a roll engaging the work and exerting tension on the work whose central working surface has a concave work engaging curvature in the form of an arc or an arc-like curve in the region of the roll base and is designed in the region of its two edges in the sense of an expansion of the pass opening enclosed by three such rolls, the improvement comprising the working surface in the region of its two edges is concave in the manner of a second arc or a second arc-like curve with a lesser curvature than the central working surface, and this second arc on each side of the working surface joins directly to the central arc of the roll base intermediate the center of the roll and the outside edge of the roll on each side and forms the balance of the roll surface and constitutes a minor portion of the roll surface.

4,311,034

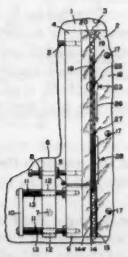
PROCESS AND APPARATUS FOR FORMING COMPRESSED CRIMPED METAL FOIL HEATER RIBBON

James A. Hall, and Raymond C. Kent, both of Lancaster, Pa., assignors to Armstrong World Industries, Lancaster, Pa.

Filed Apr. 11, 1980, Ser. No. 139,553

Int. Cl.³ B21D *13/08*

U.S. Cl. 72—318 7 Claims



1. An apparatus for uniformly compressing pre-crimped metal foil ribbons lengthwise comprising

(a) a base plate;

(b) an elongated stationary jaw mounted on said base plate;

(c) an elongated adjustable jaw of shorter length than said stationary jaw and positioned opposite thereto, said stationary and adjustable jaws having spaced-apart opposed edge portions;

(d) an elongated stationary support bar mounted on said base plate in lateral spaced relation to said adjustable jaw;

(e) adjusting means extending from said stationary support bar to the adjustable jaw to provide lateral movement thereto;

(f) a movable holding jaw positioned below said adjustable jaw, said movable holding jaw and said stationary jaw having normally spaced-apart opposed edge portions;

(g) means extending through said stationary support support bar to said movable holding jaw for providing lateral movement thereto;

(h) means connected with said holding jaw moving means for holding the movable jaw in a normally retracted position with respect to the opposed edge portions of the stationary jaw to space them apart a distance greater than the spacing between the opposing edges of the stationary and adjustable jaws;

(i) a cover plate mounted on the face of said stationary jaw and extending partially over said adjustable jaw and said movable holding jaw, said cover plate together with the base plate and the opposed spaced-apart portions of said stationary and adjustable jaws forming an elongated channel adapted to slidably receive a pre-crimped foil ribbon therein, said cover plate having a slotted opening centrally located over the space between the opposing edges of the stationary and adjustable jaws; and

(j) compressing means for insertion through one end of the slot in the cover plate to penetrate into a crimp in the pre-crimped ribbon when it is positioned in the elongated opening formed by the cover plate together with the base plate and the opposed spaced-apart edges of the stationary and adjustable jaws, said compressing means being movable to compress the pre-crimped foil lengthwise as the compressing means is moved along the slot in the cover plate from one end of the slot to the other end thereof toward the portion of the ribbon held immobile by the movable holding jaw forced thereagainst by pressure applied to the holding jaw moving means, said compressing means being adapted to be moved back to its first position.

4,311,035

TEST DEVICE FOR ACCELERATION SENSORS

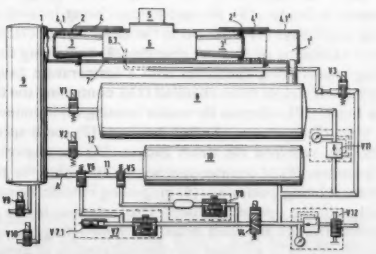
Henning Gold, Bingen, Fed. Rep. of Germany, assignor to Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V, Munich, Fed. Rep. of Germany

Filed Dec. 13, 1979, Ser. No. 103,269

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1978, 2855162

Int. Cl.³ G01P *21/00*

U.S. Cl. 73—1 D 13 Claims



8. A test device for acceleration sensors, comprising

(a) a low-friction carriage adapted for supporting acceleration sensors and means providing an air cushion for said carriage;

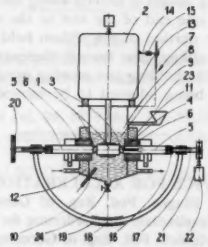
(b) drive means coupled to said carriage for producing a predetermined acceleration course of said carriage;
(c) a direct pneumatic drive provided at the carriage and having a piston and a cylinder defining an air space at one side of said carriage; and
(d) control means adapted to cause the pressure course in the air space corresponding to the desired acceleration course;
(e) at least one of said piston and said cylinder being formed conically and a rolling bellows seal being provided between said piston and said cylinder to compensate the pressure drop by the volume variation of said air space caused by travel of said piston.

4,311,036

METHOD AND DEVICE FOR TESTING LUBRICATING PROPERTIES OF LUBRICATING MEANS

Czeslaw Kajdas, Plock; Jozef Nita, Radom, and Krzysztof Krawczyk, Kielce, all of Poland, assignors to Politechnika Swietokrzyska, Kielce, Poland

Continuation of Ser. No. 967,258, Dec. 5, 1978, abandoned. This application Dec. 28, 1979, Ser. No. 108,402
Claims priority, application Poland, Dec. 10, 1977, 202856
Int. Cl.³ G01N *19/00*
U.S. Cl. 73—10 **1 Claim**



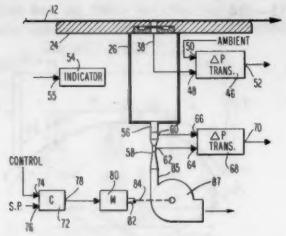
1. Device for testing the lubricating properties of the lubricating means characteristic in that a rotary test piece (1) in the shape of a ring is mounted on the shaft of an electric motor (2) driving the said test piece, and two counter-specimens (3), one of which accommodates the temperature gauge (4), are mounted in holders (5), the said holders being located in insulating guideways (6) mounted in the device body (7), the said device consisting of an inner chamber (8) containing the lubricating means being tested (9) with a temperature gauge (10) located in it and an outer chamber (11), containing the thermostate liquid (12), whereas the motor housing (2) is connected to the body (7) by means of a ball bearing (13) and a spring element (14), whereon the strain gauges (15) are cemented, the both holders (5) of counter-specimens (3), within the portions of the insulating guideways (6) projecting outside, being terminated with the insulating inserts (16), whereas in the axes of holders (5) there are blind holes accommodating the end-portions of bolts (17), screwed into the end portion of dynamometer (18), made in the shape of a half-ring with the strain gauges cemented thereon, whereas on one of the said bolts (17) there is a knob (20) for a manual adjustment of stress of dynamometer (18), the second bolt (17) being driven by a step electric motor (22) via the worm transmission (21).

4,311,037

WEB PERMEABILITY TESTER

Joel P. Gotchel, Glen Mills, and Rudolf Neuenschwander, Swarthmore, both of Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Mar. 19, 1980, Ser. No. 131,803
Int. Cl.³ G01N *15/08*
U.S. Cl. 73—38 **19 Claims**



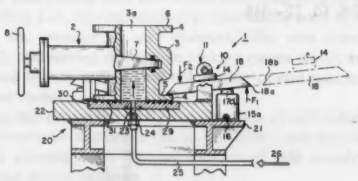
1. An instrument for measuring the permeability of a web placed against a measuring surface of the instrument comprising:
(a) a test head containing the measuring surface and having an aperture extending from the measuring surface to a surface of the head not contacted by the web, the test head having at least one static port in communication with the aperture;
(b) suction means operatively connected to the surface of the head not contacted by the web for causing a constant flow of air through the web then through the aperture; and
(c) a pressure transducer operatively connected to at least one static port, and responsive to the pressure in the static port and responsive to a reference pressure, for providing a signal representative of the pressure drop across the web, said signal being representative of the permeability of the web.

4,311,038

CLAMPING APPARATUS

Emmett L. Dunn, 103 Lazy Springs (April Sound), Montgomery, Tex. 77356

Continuation-in-part of Ser. No. 19,813, Mar. 12, 1979, abandoned. This application May 2, 1980, Ser. No. 146,172
Int. Cl.³ G01M *3/04*
U.S. Cl. 73—49.8 **15 Claims**



1. A testing apparatus for testing a flanged device having a casing defining a chamber and at least one annular end flange, including:
a horizontal test plate having a fluid inlet, said flange being disposed on said plate, a sealing element disposed on said plate underneath said flange, said inlet being in fluid communication with said chamber through said sealing element;
at least one clamping unit comprising:
(a) a lever disposed in a radial direction relative to the center of said annular flange, said lever having an outer end detachably resting on an underlying support, and an inner end gripping a portion of said flange,

(b) a fulcrum fixedly mounted above said lever intermediate its inner and outer ends, said lever being adapted to pivot about said fulcrum, and

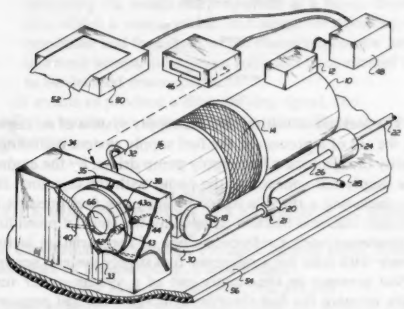
(c) force-producing means exerting a controllable vertical force against one end to said lever, thereby causing the inner end of said lever to exert a predetermined, downward clamping pressure on said flange, said clamping pressure compressing said sealing element, whereby a fluid-tight connection is established between said flange and said plate to allow said chamber in said device to accept a high-pressure fluid through said fluid inlet in said plate for testing said device.

4,311,039

DISC CENTRIFUGE PHOTOSEDIMENTOMETER

Mark E. Koehler, 16775 Elderdale Dr., Middleburg Heights, Ohio 44130; Theodore Provder, 26320 Hickory La., Olmsted Falls, Ohio 44138, and Richard A. Zander, 5506 Haverhill Dr., Parma, Ohio 44129

Filed Nov. 14, 1979, Ser. No. 93,996
Int. Cl.³ G01N *15/02*
U.S. Cl. 73—61.4 **10 Claims**



1. A photosedimentometer apparatus useful in determining particle size and size distribution of submicron size particles comprising:

a hollow cylindrically shaped disc permeable to radiant energy and having an opening in the front face thereof for injection of liquid to the interior of said disc;

a motor actuatable by a driving force and operative for rotating said disc, said motor being operable at a substantially constant speed;

a continuously variable ratio friction drive transmission coacting between said motor and said disc for rotating said disc in response to rotation of said motor and at a selectable speed of rotation in the range of from 1200 to 11000 rpm, accurate to within 1 or 2 rpm at 4000 rpm, said transmission having an input shaft directly coupled to said motor and an output shaft, said transmission including means for selecting a predetermined speed of rotation of said output shaft, and said disc being secured to said output shaft;

a radiant energy source disposed on one side of said disc and spaced therefrom;

a detector disposed on the opposite side of said disc and spaced therefrom in radiant energy receiving relation to said source; said source and detector being located adjacent the periphery of said disc;

means for collimating the radiant energy from said source; and

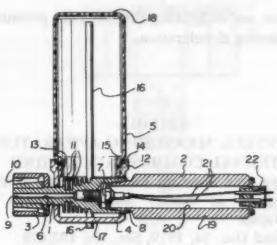
means for interrupting said driving force to said motor for a preselected interval of time measured through an electronic clock circuit including a clock source for producing clock pulses of constant duration and means for counting said pulses up to a preset value, and after said interval of time, substantially instantaneously regaining said substantially constant speed of said motor and reestablishing substantially the same selectable speed of rotation of said disc.

4,311,040

POWER CYLINDER BALANCER UNIT

Bryan R. Long, 276 Silver Brook Way NW., Calgary, Canada (T3B 5G8)

Filed May 23, 1980, Ser. No. 152,718
Int. Cl.³ G01M *15/00*; G01L *9/00*
U.S. Cl. 73—115 **6 Claims**



1. A device for measuring the pressure in a cylinder of an internal combustion engine comprising a body; inlet means in said body; connector means on said body for connecting said inlet means to an internal combustion engine to place the inlet means and hence the body in fluid communication with a cylinder of the engine; pressure transducer means in said body for producing an electrical pressure signal dependent on the pressure in said cylinder; cooling means integral with said body for cooling the body, said cooling means comprising fins on said body, a liquid container carried by said body surrounding said fins, and a vent tube in said container connecting the interior of the container to the atmosphere; and means for connecting said transducer means to an indicator circuit for receiving said electrical pressure signal and providing an indication of cylinder pressure.

4,311,041

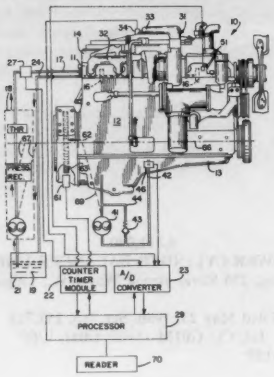
DIAGNOSIS OF ENGINE LUBRICANT SYSTEM

David L. Reid, and Dennis O. Taylor, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jun. 11, 1979, Ser. No. 47,067
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—117.3 **9 Claims**

1. The method of testing the lubricant system of an internal combustion engine, comprising the steps of sensing the pres-

sure in the lubricant system, sensing the engine speed, stabilizing the engine at a relatively high speed, adjusting the engine



for deceleration, and measuring the lubricant pressure and the engine speed during deceleration.

4,311,042

FUEL CONTROL MEASURING APPARATUS FOR INTERNAL COMBUSTION ENGINE

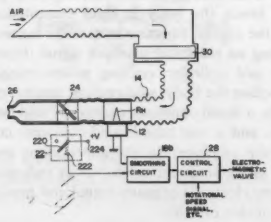
Katsumi Hosoya, and Shunichi Kadowaki, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Dec. 14, 1979, Ser. No. 103,479

Claims priority, application Japan, Dec. 22, 1978, 53-177960[U]

Int. Cl.³ G01F *1/68*

U.S. Cl. 73—118 **21 Claims**



1. Apparatus for controlling the supply of fuel to an internal combustion engine with an air intake passage thereto and fuel input control means, comprising:

(a) a hot-wire air flow meter whose hot wire is adapted to be disposed within the air intake passage; and

(b) a smoothing circuit connected to the output of the air flow meter for eliminating fluctuations of a relatively high frequency in the output signal of the flow meter whereby corresponding fluctuations in the air flow signal input to the fuel input control means are removed;

wherein the smoothing circuit includes a lowpass filter which has a time constant that is longer than the period of pulsations appearing in the flow of intake air, and that is shorter than the response period of the fuel control means; and,

wherein the low pass filter includes means for changing its cut-off frequency depending upon the rotational speed of the engine.

4,311,043

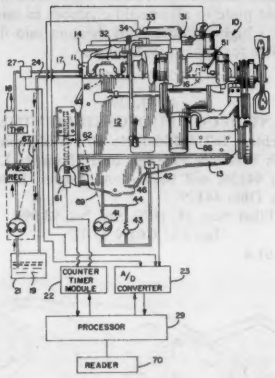
METHOD AND APPARATUS FOR DETECTING AIR IN FUEL

David L. Reid, and Dennis O. Taylor, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jun. 11, 1979, Ser. No. 46,914

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—119 A **7 Claims**



1. The method of testing the fuel supply system of an engine with the aid of a processor, the fuel supply system including a plurality of injectors, a fuel supply pump driven by the engine, and a supply rail connecting the pump with the injectors, the pump including a throttle for controlling the fuel pressure in the supply rail, said method comprising the steps of providing said processor with a reference slope of the variation in fuel pressure with time for a reference fuel supply system, sensing the fuel pressure in the supply rail of a system under test, rapidly opening the fuel throttle to increase the rail pressure, measuring said fuel pressure after said rapid throttle opening and after a plurality of time intervals, computing from said measurements the slope of pressure increase with time, and comparing said computed slope with said reference slope.

4,311,044

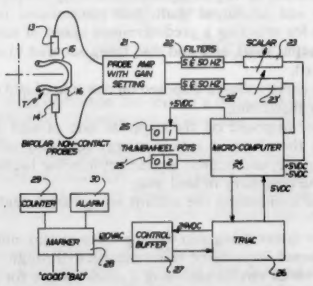
TIRE SIDEWALL BUMP/DEPRESSION DETECTION SYSTEM

Christine A. Marshall, Broadview Heights, and Michael R. Scalera, Akron, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 25, 1980, Ser. No. 124,007

Int. Cl.³ G01M *17/02*

U.S. Cl. 73—146 **8 Claims**



1. An apparatus for automatically inspecting a pneumatic

tire for broken cords and ply separation evidenced by superficial bumps/depressions in sidewalls of said tire, comprising in combination:

a tire testing machine for rotatably retaining said tire in an inspecting position; rotational driving means for rotatingly driving said tire at a preselected speed; at least one non-contact capacitance probe for sensing bumps/depressions in said sidewalls's surface and transmitting signals corresponding to said bumps/depressions sensed, said probe being disposed in spaced apart sensing relationship with said sidewall; electric control circuit means connected to said probe for producing a disqualifying signal including

(a) amplifier means for amplifying signals from said probe within a preselected range,

(b) filter means effective to produce a band pass of about 2 Hz to about 50 Hz, so as to diminish extraneous 'noise,'

(c) scalar means adapted to provide a usable wave form,

(d) analog to digital converter means responsive to said signals in digital form,

(e) computer means responsive to said signals in digital form, including

(i) means for taking a running average including means for indicating the width and amplitude of a bump/depression which is unacceptable, and means for adjusting the amplitude and frequency of the bump/depression limits to detect bumps/depressions sufficient to cause said tire to be deemed unacceptable;

(ii) means to produce a disqualifying signal, and,

classifying means for distinguishing a disqualified tire from qualified tires.

4,311,045

DEVICE FOR MEASURING SEA CURRENTS AT GREAT DEPTHS

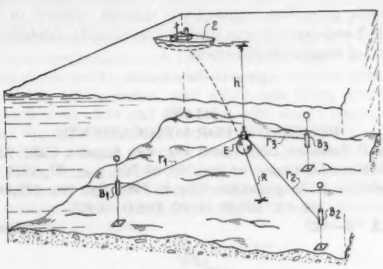
Noël Clavelloux, and Francois Peynaud, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 20, 1980, Ser. No. 151,589

Claims priority, application France, May 23, 1979, 79 13191

Int. Cl.³ G01D *21/00*

U.S. Cl. 73—170 A **12 Claims**



1. A device for measuring sea currents or current meter by means of a plunger released from a boat, descending to the bottom of the sea and drifting with the currents, wherein Nacoustic responding buoys B_1, B_2, . . . B_i, . . . B_N with $N \geqq 2$ are lowered to the bottom of the sea and positioned geographically, these buoys responding to pulses at frequency f emitted by the plunger under the control of a clock by pulses at frequencies f_1, f_2, . . . f_i, . . . f_N, the plunger receives the pulses emitted by all the buoys which, applied to counters **30.1**, **30.2** . . . **30.***i* . . . **30.**N, determine the times t_1, t_2, t_i, . . . t_N for covering the buoy-plunger distances, these buoy-plunger distances r_1, r_2, . . . r_i, . . . r_N being given by the relationship $r_i = Ct_i$ where C is the velocity of the acoustic waves in the medium, the successive values of r_I being supplied to a memory in the plunger and when the plunger arrives at a certain depth it releases its ballast and rises to the surface where it is recovered by the boat.

4,311,046

MULTIPLE SENSING DEVICE AND SENSING DEVICES THEREFORE

Roland Pittman, Maitland, Fla., assignor to Applied Devices Corporation, Kissimmee, Fla.

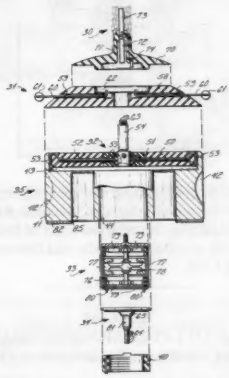
Division of Ser. No. 795,575, May 10, 1977, Pat. No. 4,197,737.

This application Jun. 25, 1979, Ser. No. 51,924

The portion of the term of this patent subsequent to Apr. 15, 1997, has been disclaimed.

Int. Cl.³ G01C *23/00*

U.S. Cl. 73—178 R **5 Claims**



1. A multiple sensing device comprising a rotatable shaft, first piezoelectric crystal sensing means mounted for rotation with said shaft for producing an output voltage responsive to angular acceleration about an axis normal to said shaft, and second piezoelectric crystal sensing means mounted for rotation with said shaft for producing an output voltage responsive to linear acceleration of said shaft in a direction normal to the axis of the said shaft, said piezoelectric crystal means being mounted independently of one another to extend in mutually orthogonal planes which intersect the axis of said shaft, further including third sensing means for producing an output voltage responsive to the flow of gas externally of said device, said third sensing means comprising a piezoelectric crystal in the form of a plate mounted at an end of said shaft, the plane of said plate extending parallel to the axis of said shaft, and longitudinally from the end of said shaft.

4,311,047

FLUID PRESENCE DETECTOR

Charlie J. Hubbard, Jr., 1906 48th St., Lubbock, Tex. 79412, and Walter E. Granberry, Jr., 4811 14th St., Lubbock, Tex. 79416

Filed Apr. 10, 1980, Ser. No. 138,986

Int. Cl.³ G01F *1/68*

U.S. Cl. 73—204 **4 Claims**

1. An apparatus for detecting the presence of a fluid flowing in a conduit, comprising in combination:

a first thermally conducting body for placement inside the conduit;

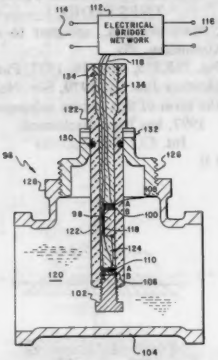
a first heater for heating the first thermally conducting body;

a second thermally conducting body for exposing to the inside of the conduit;

a second heater for heating the second thermally conducting body;

a cylinder of low thermal conductivity encircling the first thermally conducting body, the first heater, the second

heater, and part of the second thermally conducting body, wherein the cylinder extends into the conduit and the second thermally conducting body extends out of the cylinder whereby the second thermally conducting body is exposed to the inside of the conduit;



insulation material separating the first thermally conducting body from the second thermally conducting body; and

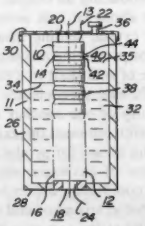
means for comparing the relative rates of heat loss from the first thermally conducting body and the second thermally conducting body.

4,311,048

LIQUID LEVEL SENSING MEANS

Kenneth M. Merz, Gladwyne, Pa., assignor to TRW, Inc., Cleveland, Ohio

Filed Feb. 21, 1980, Ser. No. 123,388
Int. Cl.[3] G01F *23/28*
U.S. Cl. 73—293 **23 Claims**



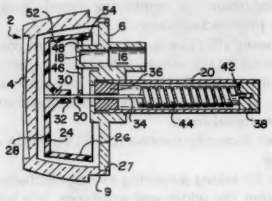
1. A liquid level sensing means for providing a continuous indication of liquid level comprising an elongated light conducting means adapted for being received into a liquid having first and second ends and a surface which provides an interface with the liquid for measuring liquid levels between the ends of the conducting means, a source providing radiation to the conducting means at its first end, and detecting means for sensing the radiation transmitted by the conducting means to its second end and providing an output signal, the conducting means being transparent to the radiation and having an index of refraction greater than that of the liquid which is to have its level measured, at least a portion of the surface of the conducting means being contoured to provide regions therealong between the ends of the conducting means with an inclination which provides radiation impinging thereon from the source with an angle of incidence which is not greater than the critical angle characterizing the liquid interfaced regions and which is greater than the critical angle characterizing regions which are not interfaced with the liquid, whereby the liquid interfaced regions refract radiation and the regions which are not interfaced with the liquid reflect radiation impinging thereon from the source, and the intensity of the radiation received by the detecting means is a function related to the level of the liquid between the ends of the conducting means.

4,311,049

THERMOMETER

Leonard J. La Passo, and Harry Benoit, both of Rockford, Ill., assignors to Motion Control, Inc., Rockford, Ill.

Filed Apr. 21, 1980, Ser. No. 142,338
Int. Cl.[3] G01K *5/62*
U.S. Cl. 73—362.4 **13 Claims**



1. A thermometer comprising:

a housing including a lens member and a sensing sleeve extending from said lens member, said lens member being configured to define an enclosed chamber;

a rotatable shaft disposed within said sensing sleeve and extending into said chamber;

an indicator head for indicating temperature mounted on said shaft for rotation therewith, said indicator head being of substantial mass and substantially filling said chamber;

a temperature responsive element mounted within said sleeve and operatively associated with said shaft to rotate said shaft and said indicator head in response to a change in temperature; and

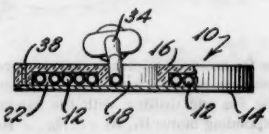
non-fluid, mechanical means within said chamber operatively associated with said indicator head for constraining mechanically induced rotation of said shaft and indicator head to a pre-determined arc of angular displacement while permitting temperature induced rotation of said shaft and said indicator head to exceed said predetermined arc of angular displacement.

4,311,050

RESERVOIR FOR MEDICAMENTS

Samuel P. Bessman, 2025 Zonal Ave., Los Angeles, Calif. 90033

Continuation-in-part of Ser. No. 69,765, Aug. 27, 1979, abandoned. This application Oct. 8, 1980, Ser. No. 195,090
Int. Cl.[3] G01F *19/00*; B65D *85/02*
U.S. Cl. 73—427 **11 Claims**



1. A reservoir for a liquid medicament adapted to visual indication of microliter changes in medicament volume which comprises:

a pair of generally circular plate members, at least one of which is transparent;

a spirally coiled, transparent, medicament holding tubular member disposed in a planar configuration between said plate members, one end of said tubular member porting in a center opening in one of said plate members and the

other end of said tubular member porting at the circumference of said plate members;

means disposed on one of said ends of said tubular member and adapted for attachment to liqud withdrawal means, and

indicia on said transparent plate member, said indicia arranged to provide a measure of medicament volume change within the reservoir as medicament is drawn therefrom.

4,311,051

ACCELERATION DETECTOR FOR USE AS A DECELEROMETER FOR THE CONTROL OF ELECTRICALLY OPERATED AXLE BRAKES

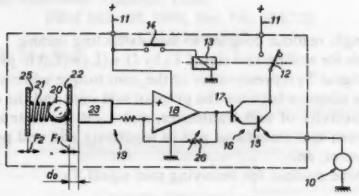
Christian V. Eon, and Jean-Pierre M. C. Dumont, both of Nevers, France, assignors to Societe Anonyme Francaise Du Ferodo, Paris, France

Filed Dec. 13, 1979, Ser. No. 103,059

Claims priority, application France, Dec. 15, 1978, 78 35433

Int. Cl.³ G01D *15/08*

U.S. Cl. 73—517 R **9 Claims**



5. An acceleration or deceleration detector, said detector comprising a movable member, elastic return means permanently urging said movable member towards stop means, and a fixed member comprising a proximity detector means for delivering a voltage proportional to the distance separating said proximity detector means from said movable member, said stop means for said movable member being spaced from said proximity detector means with the spacing being one wherein as soon as said proximity detector means is put into operation the output voltage of said proximity detector means is nonzero, said movable member being disposed in a guide tube in gentle frictional engagement with said guide, said guide tube being closed at one end by an end wall forming a support surface for said elastic return means, said guide tube being removably mounted at its other end on a base with spacer means of selected thickness interposed between said guide tube and said base, said proximity detector means being mounted on said base along the axis of movement of said movable member, and second spacer means of selected thickness being mounted on said proximity detector means facing the movable member and defining said stop means.

4,311,052

ULTRASONIC CONTROL CONTOUR FOLLOWER

Nathaniel B. Jeffras, and Donald R. Modispacher, both of Woodland Hills, Calif., assignors to Automation Industries, Inc., Greenwich, Conn.

Filed Jan. 11, 1979, Ser. No. 2,732

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—634 **32 Claims**

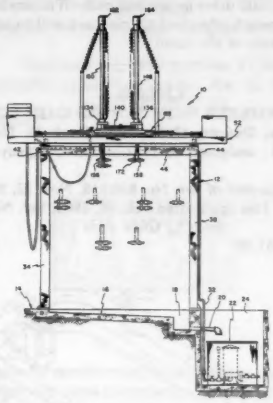
32. A contour following and testing apparatus comprising:

at least one test sensor;

means for supporting and guiding said at least one test sensor along first, second and third mutually perpendicular axes, around said third axis and around a fourth axis parallel to said first and second axes;

at least one position sensor mechanically connected to said test sensor; and

means operative to receive position signals from said at least one position sensor, and to control said supporting and guiding means so as to maintain said at least one test sensor



perpendicular to the contoured surface of a testpiece and to maintain a constant scan speed of said at least one test sensor relative to the contoured surface of the testpiece.

4,311,053

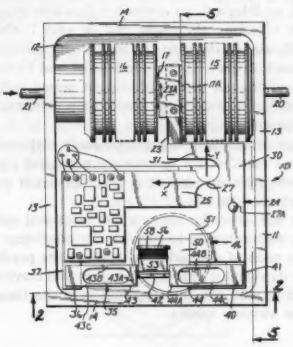
VIBRATING BEAM PRESSURE SENSOR

Gerald R. Cucci, Minneapolis, Minn., assignor to Rosemount, Inc., Eden Prairie, Minn.

Continuation of Ser. No. 39,356, May 14, 1979, abandoned. This application Oct. 22, 1980, Ser. No. 199,597

Int. Cl.³ G01L *11/00*

U.S. Cl. 73—704 **18 Claims**



1. A pressure sensor providing an output signal that is proportional to the natural frequency of a vibrating beam having a longitudinal axis, comprising;

a base;

means to mount one end of said beam with respect to said base;

an actuator;

a first end of said actuator being operably coupled to an opposite end of said beam from the attachment of said beam to said base;

means to apply a pressure signal to said actuator to cause said actuator to change the force exerted on said beam by said actuator in direction along the longitudinal axis of said beam;

drive means having a longitudinal axis substantially normal

to the longitudinal axis of the beam to provide a driving signal to oscillate said beam at its natural frequency;

and pick-off means to sense the frequency of oscillation of said beam, said drive means and pick-off means being fixed relative to each other and coupled as a unit to said base on the same side of the beam.

4,311,054

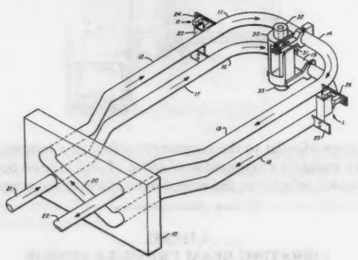
MASS FLOWMETER WITH SENSOR GAIN CONTROL

Bruce M. Cox, Duncan, Okla., and Morris D. Ho, Walnut Creek, Calif., assignors to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 960,518, Nov. 13, 1978, Pat. No. 4,192,184. This application Feb. 28, 1980, Ser. No. 125,414

Int. Cl.³ G01F *1/84*

U.S. Cl. 73—861.38 **11 Claims**



1. A mass flowmeter system of the coriolis force type, comprising:

a base member;

at least one generally U-shaped tube having two side legs joined together by a cross member, the free ends of said side legs being rigidly attached to said base member and forming an inlet and an outlet for flowable material;

means for vibrating the bight end of said U-shaped tube perpendicular to the plane of said U-shaped tube;

sensor means on each of the side legs of said U-shaped tube for generating an electrical output signal indicative of when each of said side legs reaches a predetermined point in its vibratory motion;

third sensor means located approximately at the midpoint of said cross member for generating a control signal when said cross member reaches a predetermined point in its vibratory motion; and,

means for automtically varying the electrical gain of said side leg sensor means to provide for consistent detection of when each of said side legs reaches the predetermined point in its vibratory motion, wherein said control signal is supplied to said gain varying means as the time basis for said gain varying means.

4,311,055

PRESSURE SUIT JOINT ANALYZER

Hubert C. Vykukal, Los Altos, and Bruce W. Webbon, San Jose, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 11, 1980, Ser. No. 168,943

Int. Cl.³ G01L *3/00*

U.S. Cl. 73—862.08 **6 Claims**

5. Apparatus adapted for simultaneously measuring torque and flexure angle of a pressure suit joint during the state of flexure while one joint end is fixed and the other is moved, said apparatus comprising;

a torque transducer attached to the movable end of said joint and generating a signal representative of torque T_1;

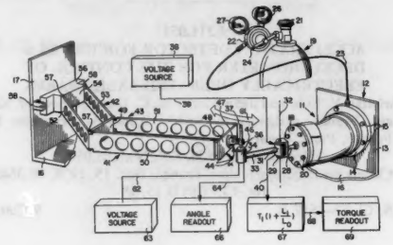
a potentiometer;

arm means for connecting said potentiometer to said transducer;

means for gripping the wiper shaft of said potentiometer and maintaining it at a fixed angle in space while said potentiometer is moved;

means for applying a voltage to said potentiometer;

means for extracting a voltage from said potentiometer representative of the flexure angle of said joint;



an angle readout coupled to said extracting means;

means for scaling said signal T_1 by $(1+(L_1)/(L_o)$ to produce a signal T_2 representative of the joint torque wherein L_1 is the distance between the pivot of said joint and the axis of sensitivity of said transducer, and L_o is the distance between said transducer axis of sensitivity and said potentiometer; and

a torque readout for receiving said signal T_2.

4,311,056

PRE-SETTING FINE TUNING DEVICE FOR A TURRET TYPE TELEVISION TUNER

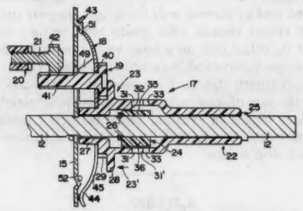
Takeyoshi Tanida, Mie, Japan, assignor to New Nippon Electric Company, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 14,828, Feb. 26, 1979, Pat. No. 4,253,074. This application Nov. 27, 1979, Ser. No. 97,847

Claims priority, application Japan, Feb. 27, 1978, 53/25470; Nov. 30, 1978, 53/165711[U]

Int. Cl.³ H03J *5/28;* **G05G** *1/10;* **F16H** *35/06*

U.S. Cl. 74—10.85 **15 Claims**



1. In a television tuner of the turret type wherein a selector shaft carries a rotatable turret in a chassis, and which includes a plurality of tuning coil units corresponding to different television channels each tuning coil unit having an adjustable element, the improvement comprising memory fine tuning means for adjusting any one of said adjustable elements when said rotatable turret is in a predetermined position, said fine tuning means comprising fine tuning driving means mounted concentrically around said selector shaft, said fine tuning driving means including a fine tuning shaft, slide gear means and cam surface means for rotatably connecting said slide gear means to said fine tuning shaft, slip clutch means rotatably connected to said slide gear means, spring means disposed on said chassis for normally biasing said slide gear means in a direction away from said chassis; and idler means supported in said spring means for transmitting rotary movement of said fine tuning driving means to said adjustable element for adjusting said adjustable element in a selected one of said tuning coil units, and wherein the shape of said spring means at the time of the initial rotation of said fine tuning shaft is changed by the movement of said slide gear means in response to a continuous rotating force for engaging said idler means with said adjustable element whereby a memory fine tuning is provided.

4,311,057

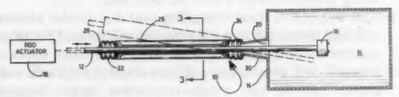
HERMETIC SEAL FOR A SHAFT

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Frank Lombardi, Altadena, Calif.

Filed May 30, 1980, Ser. No. 154,725

Int. Cl.³ F16J *15/50*

U.S. Cl. 74—18.1 **1 Claim**



1. An hermetic seal for sealing an aperture defined in a wall having opposed first and second faces and a shaft axially extended through the aperture and supported by the seal for simultaneous pivotal, angular, and linear motion, comprising:

A. an impervious, substantially tubular body concentrically receiving said shaft in supporting relation therewith having a first end affixed to the first face of the wall in sealed relation therewith and a second end affixed to said shaft in sealed relation therewith, said second face of said wall being in communication with the interior of said body whereby said aperture is sealed by said body; and

B. means for accommodating simultaneous angular, linear and pivotal motion of said shaft including

means for accommodating linear motion of said shaft relative to said aperture comprising a first linear array of radially and axially deformable annular flutes defined in said tubular body adjacent to the first end thereof, and a second linear array of radially and axially deformable annular flutes defined in said tubular body adjacent the second end thereof,

means for accommodating angular motion of said shaft comprising an annular array of angularly deformable flutes concentrically related to said shaft extended axially between said first and second linear arrays of deformable annular flutes,

means for accommodating pivotal motion of said shaft comprising said first linear array of radially and axially deformable annular flutes, whereby angular motion imparted to said shaft causes said linear flutes to be angularly deformed and foreshortened and said annular flutes to be axially elongated and radially contracted for accommodating the foreshortening of said flutes, linear motion imparted to said shaft causes said first and second arrays of annular flutes to be axially and radially deformed, and pivotal motion imparted to said shaft causes said first array of annular flutes to be axially and radially deformed.

4,311,058

DEVICE FOR TRANSFORMING ROTATIONAL MOVEMENT INTO LINEAR MOVEMENT OR THE REVERSE

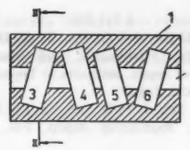
Bengt Lundgren, Lerum, Sweden, assignor to SKF Nova AB, Sweden

Filed Nov. 27, 1979, Ser. No. 97,944

Claims priority, application Sweden, Jan. 26, 1979, 7900697

Int. Cl.³ F16H *21/16*

U.S. Cl. 74—89 **7 Claims**



1. A device for transforming rotational movement into linear movement or vice versa comprising a cylindrical shaft member and a support having a bore therein through which the shaft extends of larger diameter than the shaft, said support displaceable axially relative to the shaft, a plurality of openings in said support disposed angularly relative to the shaft, a bearing mounted in each opening of said support, each bearing having a circular cylindrical outer configuration and including an outer ring member and an inner ring member rotatable relative to said support, the bore diameter of said inner bearing ring member being larger than the shaft diameter and the axis of the bearing being inclined relative to the shaft, means for moving each bearing in its opening so that the inner ring member contacts said shaft, said openings extending through said support transversely to said shaft and being of a predetermined constant uniform cross section for their entire extent, the cross section of each of said openings corresponding to the profile of its respective outer bearing ring member for ease of assembly therein.

4,311,059

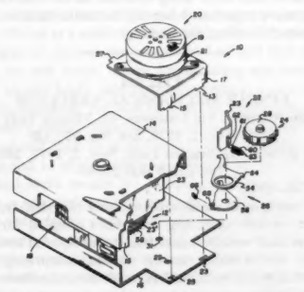
MEANS PROVIDING INTERMITTENT MOTION TO A CAM MEANS OF A TIMING MECHANISM

William E. Wagle, Bloomington, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Aug. 31, 1979, Ser. No. 71,727

Int. Cl.³ F16H *29/00;* **H01H** *7/08*

U.S. Cl. 74—116 **8 Claims**



1. A timing mechanism comprising:

(1) motor drive means

(2) cam means and electrical switch means opening and closing in response to said cam means, and

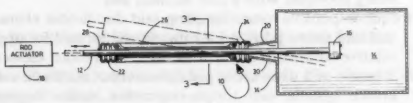
direction away from said chassis; and idler means supported in said spring means for transmitting rotary movement of said fine tuning driving means to said adjustable element for adjusting said adjustable element in a selected one of said tuning coil units, and wherein the shape of said spring means at the time of the initial rotation of said fine tuning shaft is changed by the movement of said slide gear means in response to a continuous rotating force for engaging said idler means with said adjustable element whereby a memory fine tuning is provided.

4,311,057

HERMETIC SEAL FOR A SHAFT

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Frank Lombardi, Altadena, Calif.

Filed May 30, 1980, Ser. No. 154,725
Int. Cl.³ F16J *15/50*
U.S. Cl. 74—18.1 **1 Claim**



1. An hermetic seal for sealing an aperture defined in a wall having opposed first and second faces and a shaft axially extended through the aperture and supported by the seal for simultaneous pivotal, angular, and linear motion, comprising:

A. an impervious, substantially tubular body concentrically receiving said shaft in supporting relation therewith having a first end affixed to the first face of the wall in sealed relation therewith and a second end affixed to said shaft in sealed relation therewith, said second face of said wall being in communication with the interior of said body whereby said aperture is sealed by said body; and

B. means for accommodating simultaneous angular, linear and pivotal motion of said shaft including

means for accommodating linear motion of said shaft relative to said aperture comprising a first linear array of radially and axially deformable annular flutes defined in said tubular body adjacent to the first end thereof, and a second linear array of radially and axially deformable annular flutes defined in said tubular body adjacent the second end thereof,

means for accommodating angular motion of said shaft comprising an annular array of angularly deformable flutes concentrically related to said shaft extended axially between said first and second linear arrays of deformable annular flutes,

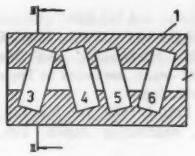
means for accommodating pivotal motion of said shaft comprising said first linear array of radially and axially deformable annular flutes, whereby angular motion imparted to said shaft causes said linear flutes to be angularly deformed and foreshortened and said annular flutes to be axially elongated and radially contracted for accommodating the foreshortening of said flutes, linear motion imparted to said shaft causes said first and second arrays of annular flutes to be axially and radially deformed, and pivotal motion imparted to said shaft causes said first array of annular flutes to be axially and radially deformed.

4,311,058

DEVICE FOR TRANSFORMING ROTATIONAL MOVEMENT INTO LINEAR MOVEMENT OR THE REVERSE

Bengt Lundgren, Lerum, Sweden, assignor to SKF Nova AB, Sweden

Filed Nov. 27, 1979, Ser. No. 97,944
Claims priority, application Sweden, Jan. 26, 1979, 7900697
Int. Cl.³ F16H *21/16*
U.S. Cl. 74—89 **7 Claims**



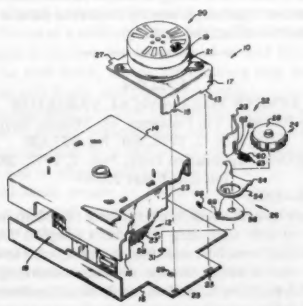
1. A device for transforming rotational movement into linear movement or vice versa comprising a cylindrical shaft member and a support having a bore therein through which the shaft extends of larger diameter than the shaft, said support displaceable axially relative to the shaft, a plurality of openings in said support disposed angularly relative to the shaft, a bearing mounted in each opening of said support, each bearing having a circular cylindrical outer configuration and including an outer ring member and an inner ring member rotatable relative to said support, the bore diameter of said inner bearing ring member being larger than the shaft diameter and the axis of the bearing being inclined relative to the shaft, means for moving each bearing in its opening so that the inner ring member contacts said shaft, said openings extending through said support transversely to said shaft and being of a predetermined constant uniform cross section for their entire extent, the cross section of each of said openings corresponding to the profile of its respective outer bearing ring member for ease of assembly therein.

4,311,059

MEANS PROVIDING INTERMITTENT MOTION TO A CAM MEANS OF A TIMING MECHANISM

William E. Wagle, Bloomington, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Aug. 31, 1979, Ser. No. 71,727
Int. Cl.³ F16H *29/00*; H01H *7/08*
U.S. Cl. 74—116 **8 Claims**



1. A timing mechanism comprising:

(1) motor drive means

(2) cam means and electrical switch means opening and closing in response to said cam means, and

(3) intermittent drive means coupling said cam means to said motor drive to provide intermittent rotation of said cam means comprising:

a geneva gear means coupled to said motor drive means and including cooperating drive teeth and dwell spaces, and eccentric drive means coupled to said geneva gear means and including a drive pawl engaging said means to intermittently drive same,

said geneva gear means programmed such that said dwell spaces are operative to prevent rotation of said eccentric during retraction of said drive pawl.

4,311,060

PARKING BRAKE OPERATING DEVICE

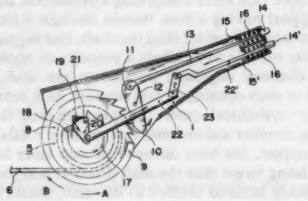
Hiroshi Kawaguchi, Mishimashi, and Masaki Sanayama, Susonoshi, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Feb. 4, 1980, Ser. No. 118,102

Claims priority, application Japan, Feb. 13, 1979, 54-015913[U]

Int. Cl.³ F16H *27/02;* **B60K** *41/24;* **A63B** *61/04*

U.S. Cl. 74—142 **5 Claims**



4. A parking brake operating device comprising a brake handle; a rotating member having a brake cable winding portion and also having teeth which are formed on both outer and inner circumferential surfaces of said rotating member, a pair of cams releasably engaged with said teeth respectively in such a manner that said rotating member can rotate in a single direction only, reverse rotation being prevented by either one of said cams; respective two operating rods having springs, said cams being connected to said respective operating rods having springs, said cams being adapted to be engaged with or released from said teeth of said rotating member, said cams and said two operating rods forming a pair of locking mechanisms for said rotating member, both of said cams and both of said rods being mounted inside of said brake handle, whereby said handle can be easily manipulated by a single hand of a user, and at least one of said cams being mounted to the brake handle so that they move together; whereby the brake handle is repeatedly operated to effect the braking.

4,311,061

LINEAR MECHANICAL VARIATOR

Ferdinando Battistin, Via Costanza, 41, Milano, Italy

Filed Nov. 2, 1978, Ser. No. 957,320

Claims priority, application Italy, Nov. 7, 1977, 29371 A/77

Int. Cl.³ F16H *15/40*

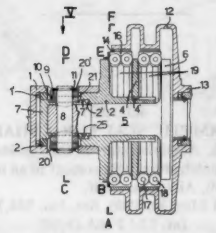
U.S. Cl. 74—190.5 **6 Claims**

1. In a mechanical variator comprising two shaft members; a radial disc system including two discs coupled for rotation with a first shaft member, said discs being tapered toward their periphery; and a roller crown system comprising a roller crown and a plurality of rollers, each of said rollers disposed within said roller crown so as to rotate about an axis lying in a plane perpendicular to a second shaft member, said roller crown system being coupled for rotation with said second shaft member and being interposed between said discs, the improvement in said mechanical variator comprising, in combination:

a first disc-holder element carried by said first shaft member and having a first disc of said radial disc system mounted thereto;

a second disc-holder element carried by said first shaft member coaxially with said first disc-holder element and having a second disc of said radial disc system mounted thereto, said second disc-holder element being axially slidable relative to said first disc-holder element;

spring means mounted relative to said disc-holder elements for urging relative axial displacement of said disc-holder elements, wherein said discs are urged into contact with said roller crown system;



a sleeve portion on said first shaft member, said portion being provided with a cam surface; and

torque-responsive means coupling said disc-holder elements and said sleeve portion for rotation and formed for urging relative axial displacement of said disc-holder elements, wherein said discs are urged into contact with said roller crown system, said torque-responsive means engaging said cam surface at a position dependent upon the torque transmitted by said first shaft member, thereby providing a torque-responsive frictional coupling force between said radial disc system and said roller crown system.

4,311,062

COUNTERSHAFT GEAR TRANSMISSION

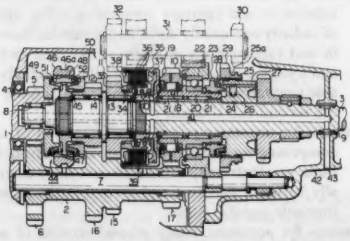
Hideo Hamada, Yokosuka, and Masaaki Suga, Yokohama, both of Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Jun. 4, 1979, Ser. No. 45,067

Claims priority, application Japan, Jun. 19, 1978, 53-73246

Int. Cl.³ F16H *3/10;* **B60K** *41/06;* **F16D** *47/04*

U.S. Cl. 74—333 **2 Claims**



1. A countershaft gear transmission comprising:

an input shaft;

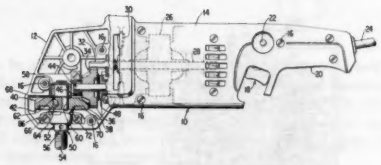
a countershaft drivingly connected to said input shaft;

a main shaft;

a one way clutch including an inner first race surrounded by an outer second race, said second race being formed with a first main gear, said first race being rotatably mounted on said main shaft and having an extension protruding axially away from said first main gear through and beyond a bearing rotatably supporting said extension;

a second main gear rotatably mounted on said main shaft;
a first counter gear in constant meshing engagement with said first main gear and integral with said countershaft;
a second counter gear in constant meshing engagement with said second main gear;
means coupled with said main shaft for rotation therewith, for coupling the end of the extension on said first race of said one-way clutch with said main shaft in all forward gear ratios including a predetermined gear ratio and the next higher gear ratio;
clutch means, coupled with said main shaft for rotation therewith, for coupling said second main gear with said main shaft in said higher gear ratio;
the speed reduction between said first main gear and said first counter gear being smaller than that between said second main gear and said second counter gear,
said one-way clutch being constructed such that it allows rotation of said first race to overrun said second race, thus absorbing a difference in rotational speed between said first race and said second race formed with said first main gear when said higher gear ratio is established, and such that when said predetermined gear ratio is established it allows unitary rotation of said first race and said second race formed with said first main gear,
whereby shifting between said predetermined gear ratio and said higher gear ratio can be effected with said input shaft being subjected to torque stress.

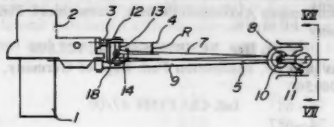
4,311,063
BEARING AND BEARING MOUNT AND TOOLS INCORPORATING SAME
James R. Sistare, Pickens, S.C., assignor to The Singer Company, Stamford, Conn.
Filed Jun. 2, 1980, Ser. No. 155,704
Int. Cl.³ F16H *35/06, 35/08*
U.S. Cl. 74—395 **11 Claims**



1. In an electrically driven power tool having a right-angle output drive comprising a beveled pinion output ring gear slidable on an output shaft, a bearing and bearing mount comprising an adjustable combined sleeve and thrust bearing which may be adjusted during assembly for endwise positioning, in combination with such output shaft and beveled ring gear carried thereby to provide for adjustment of the gear in its mating relationship with an associated beveled pinion gear to provide smooth, quiet, and long life operation.

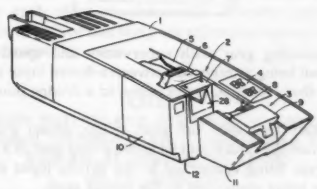
4,311,064
TRANSMISSION OPERATING DEVICE
Kazumi Sukeshita, Koganei, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Dec. 26, 1979, Ser. No. 106,912
Claims priority, application Japan, Dec. 29, 1978, 53-179473[U]
Int. Cl.³ G05G *9/18*
U.S. Cl. 74—473 R **3 Claims**

1. Apparatus for manually operating a vehicle transmission, comprising:
a transmission control shaft offset laterally to one side of the longitudinal vehicle axis;
a hand lever movably supported by a fulcrum lying on said vehicle axis;
a control rod for transmitting motion from said hand lever to said control shaft, one end of said control rod being connected to said control shaft by means including a universal



joint offset laterally from the axis of said control shaft in the direction of said vehicle axis, and the opposite end of said control rod being connected to said hand lever.

4,311,065
PAPER TAPE PUNCH ASSEMBLY
Jerome L. DeBoo, Barrington, and David G. Geis, Chicago, both of Ill., assignors to Teletype Corporation, Skokie, Ill.
Filed Apr. 27, 1979, Ser. No. 33,762
Int. Cl.³ G05G *1/00;* **F16H** *29/04, 35/08*
U.S. Cl. 74—571 M **2 Claims**

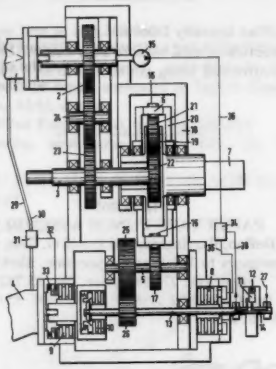


1. A punch assembly for paper data tape having drive apertures along the length thereof comprising: a toothed drive wheel for engaging said drive apertures in said tape to advance said tape in fixed increments through the assembly, means for selectively driving said toothed wheel in response to control signals and to periodic rotational motion applied to said driving means, a link, one end of said link being coupled to said driving means for imparting said periodic rotational motion to said driving means; and an adjustable eccentric assembly, said eccentric assembly comprising: a shaft, a first means having an aperture therethrough for mounting said first means on said shaft and eccentric therewith, said first means arranged to be rotatably driven at a uniform rate; a body; a ball bearing assembly arranged to receive the second end of said link and to be mounted on said body; means for securing said ball bearing assembly to said body; said body comprising: a circular outer surface for engaging the race of said ball bearing assembly, a circular inner surface substantially larger in diameter than the diameter of said shaft to permit said shaft to be passed through said body and to adjust said body relative to the circular surface of said shaft, means for securing said body to said first means in a selected position including: adjusting means for adjusting the relative position of said body about said shaft to select a position corresponding to a desired eccentric motion, said adjusting means comprising: a mounting screw; a cylindrical sleeve having an eccentric passage therethrough for receiving said mounting screw and comprising an exposed flange for rotating said sleeve about said mounting screw, a mating passage through said first means for receiving said sleeve and means in said body for engaging said mounting screw, and a second mounting means for locking said body to said first means in said selected position.

4,311,066
REDUCTION GEAR AND SPEED CONTROL FOR DREDGE PUMPS

Bernd Schuhmann, Dortmund, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 21, 1979, Ser. No. 105,896
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1979, 2901560
Int. Cl.³ F16H *47/04*
U.S. Cl. 74—687 **7 Claims**



1. A reducing gear with supervisory and speed control systems, and being interposed between a driven input shaft and an output shaft, leading, for example, to a dredge pump, comprising:

a planetary gear with sun gear, spider, planet gears journalled on the spider, and an internal ring gear in a ring, the sun gear being connected to the driven input shaft, the spider being connected to the output shaft;

an intermediate shaft with a gear, said ring carrying an outer gear, meshing with the gear on the intermediate shaft;

a speed-controlled, hydrostatic motor;

transmission means for connecting the motor to the intermediate shaft, for driving the shaft at a speed depending upon the speed of the motor;

a flow-reversible, adjustable, auxiliary pump;

gear means, drivingly connecting said input shaft to said pump;

conduit means, interconnecting the pump and the motor so that the pump operates the motor; and

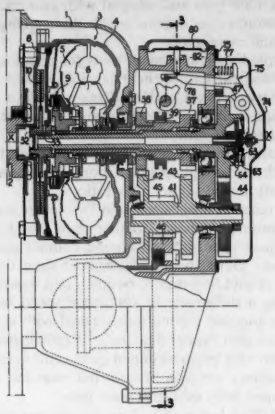
brake means included in the transmission means and provided to prevent the planetary gear from driving the motor via the transmission means.

4,311,067
AUTOMATICALLY CONTROLLED TRANSMISSION DEVICE, IN PARTICULAR FOR AN AUTOMOBILE VEHICLE

Armand Froumajou, Osny, France, assignor to Automobiles Peugeot and Societe Anonyme Automobiles Citroen, both of Paris, France

Filed Nov. 2, 1979, Ser. No. 90,576
Int. Cl.³ F16H *47/00, 3/08*
U.S. Cl. 74—718 **19 Claims**

1. A transmission device, in particular for an automobile vehicle, comprising a hydrokinetic converter having a pump element and a turbine element, a mechanism having means for providing two forward gear ratios and two inlet elements, a first clutch disposed between said turbine element and said first input element, means connected to rotate with said pump element, a second clutch disposed between the means connected to rotate with said pump element and said second input element, said two clutches being disposed inside the hydrokinetic converter, a common actuating means for actuating said

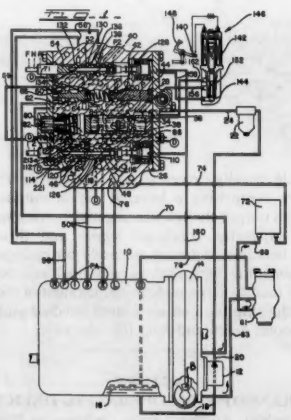


clutches being interposed between said clutches and a unidirectional coupling connected in parallel with said first clutch.

4,311,068
MODULATED TRANSMISSION WITH CONVERTER AND MODULATOR-LOAD-PISTON WHICH FULLY RESETS AND DUMPS CONVERTER

Probir K. Chatterjea, Mount Prospect, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed May 10, 1979, Ser. No. 37,596
Int. Cl.³ F16H *47/06;* F16D *33/06*
U.S. Cl. 74—733 **17 Claims**



1. In a rate of rise valve assembly for an hydraulic torque converter (**14**) transmission, said transmission provided with an hydraulic cylinder operated friction device (F) selectable to establish drive and affording a power shift drive capability including at least one of direction-change shift capability and of change-speed shift capability, said hydraulic torque converter (**14**) having at least one higher slip condition below normal slip at full operating capacity, said assembly having a bore (**34**) with a signal pressure (S) chamber (**82**) spaced from a bore end (**86**), rate-of-rise modulating valve (**58**) in the end (**86**) of said bore connected to the cylinder of said selectable

device (F) and having a load-piston-loaded modulating valve spring (88) projecting therepast toward said chamber (82), and a piston-coverable bypass port (209) also therepast in the bore connected to one of the inlet-outlet connections on the hydraulic converter to bypass same to drain when the port is open and cause a transient high slip, moderate torque capacity condition in the converter:

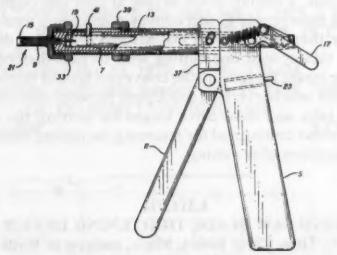
the improvement of a dual function load piston (164) which is movably mounted in said bore (34) intermediate said signal pressure (S) chamber (82) and modulating valve spring (88) and which, along with its movement toward said end (86) of the bore (34) and toward covering the bypass port (209), is at the same time proceeding in a direction causing a cylinder pressure rate of rise by increasing at unvarying rate the loading pressure on the modulating valve spring (88).

4,311,069

WIRE PULLING HAND TOOL

Richard P. Walker, Sagertown, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jun. 23, 1980, Ser. No. 161,800
Int. Cl.³ B25B *25/00, 33/00*
U.S. Cl. 81—3 J **10 Claims**



1. In a hand tool for effecting movement of a wire and block with respect to one another including a handle connected to an inner sleeve holder and attached inner sleeve and an outer sleeve holder and outer sleeve telescoped over and movable with respect to the inner sleeve holder and said inner sleeve, the improvement comprising:

collet means formed to receive and grip said wire; lever means for activating said collet means to effect gripping of said wire; and

trigger means responsive to initial pressure with respect to said handle to effect movement between said inner sleeve holder, said inner sleeve, said wire, and said outer sleeve holder, said outer sleeve, and said block to cause said block to move with respect to said wire and upon added pressure on said trigger means to cause said lever means to release said collet means and said gripping of said wire and to move said block, said outer sleeve holder, said outer sleeve, said wire with respect to said inner sleeve holder and said inner sleeve whereby said wire is gripped, moved with respect to said block, and released.

4,311,070

DOUBLE ENDED ADJUSTABLE WRENCH

Carl Whiteford, 3 High Point Rd., Westport, Conn. 06880

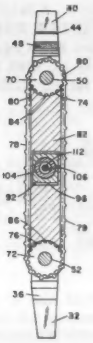
Filed May 15, 1980, Ser. No. 150,209
Int. Cl.³ B25B *13/10*
U.S. Cl. 81—77 **7 Claims**

1. A double ended adjustable wrench comprising:

A. an elongate body adapted to be held in the and of a user, said body comprising two substantially identical body members disposed in longitudinally facing relationship,

B. opposite end portions of each body member being so shaped as to cooperate with the end portions of the other body member to define jaws at opposite ends of said body for receiving a member to be turned,

C. means located adjacent opposite ends of said body for connecting said body members together for causing relative lateral movement of both ends of said body members toward and away from each other, and



D. means operative connected to both said connecting means for actuating both said connecting means in synchronism to move said body members toward and away from each other simultaneously whereby said jaws at opposite ends of said body are adjustably opened or closed simultaneously.

4,311,071

SCREW DRIVER AND SCREW HEAD SYSTEM

Marvin Bassell, 192-20B-67th Ave., Fresh Meadows, N.Y. 11365

Filed Jan. 31, 1980, Ser. No. 117,067
Int. Cl.³ B25B *15/00*
U.S. Cl. 81—436 **3 Claims**

1. A screw and screw driver system in which the screw comprises a shank portion having an exterior thread, a head portion and an imaginary central axis;

the head portion having a plateau portion connected to said shank portion and two opposed raised protruding portions equidistant from said axis and in opposite quadrants of said plateau portion, the closest distance between said protruding portions being the gap D;

each of said protruding portions having two flat side walls prependicular to each other, each side wall being parallel to a side wall of the opposite protruding portion, with the longest distance between the parallel side walls along an imaginary line perpendicular thereto and meeting an imaginary extension of one side wall being E+E';

each of said side walls being undercut so that they are angled inwardly relative to said axis;

the other two opposite quadrants of said plateau portion being flat and lying in a single plane;

the screw driver fitted against said screw head portion to apply rotative force thereto comprising a handle portion, a shank portion and a blade portion;

said blade portion having a flat bottom edge with a width W, two flat opposed cam sides starting at said bottom edge and angled inwardly therefrom, and two flat opposed side walls angled outwardly from the top of said cam sides; wherein said blade width W is less than the gap D and greater than the side wall distance E+E'.

4,311,072

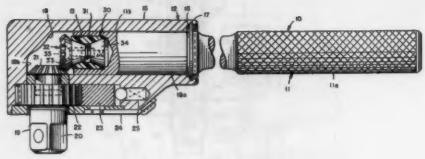
SPEED HANDLE RATCHET WRENCH

James L. Hudgins, Box 807, Cedar Crest, N. Mex. 87008

Filed May 14, 1980, Ser. No. 149,687

Int. Cl.³ B25B *23/14*

U.S. Cl. 81—476 **8 Claims**



1. A speed handle ratchet wrench comprising an elongated handle and a head assembly at one end of said handle; said head assembly including a head housing rotatably receiving said one end of said handle for independent rotation of said handle about its longitudinal axis, a drive member carried by said housing for rotation about an axis transverse to said longitudinal axis, and housing for rotation of said drive member one way or the other about said transverse axis in response to oscillation of said handle; and a clutch assembly within said head housing coupling said handle and drive member for simultaneous rotation about said longitudinal axis and said transverse axis, respectively, only below a preselected torque load level; said clutch assembly including a clutch sleeve and a clutch body interposed between said handle and said drive member; said body operatively engaging said drive member and said sleeve being slidable relative to one of said handle and body when said preselected torque load level is exceeded; said sleeve being formed of tough but slightly deformable material and being provided with a bore defining at least one frusto-conical clutch surface; said body being disposed within said bore and frictionally engaging said clutch surface; said handle having an end portion defining a recess receiving said clutch assembly within said head housing; said sleeve having an outer surface secured to said handle within said recess.

4,311,073

METHOD AND APPARATUS FOR CUTTING BRICK MOULDINGS FROM A CLAY STRIP

Karl Brugger, Dieteheim, and Josef Schwarz, Vonringen, both of Fed. Rep. of Germany, assignors to Lingl Corporation, Paris, Tenn.

Filed Aug. 20, 1979, Ser. No. 68,732

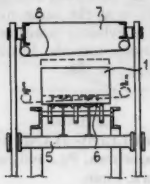
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1978, 2838739

Int. Cl.³ B26D *7/06*

U.S. Cl. 83—23 **18 Claims**

1. A method of cutting brick mouldings from a clay strip comprising the steps of conveying a strip to be cut into a specific position on a conveyor comprised of spaced apart conveyor belts, transferring the strip from the specific position on the conveyor to a table having a spaced apart support, by causing relative vertical movement between the table and the conveyor so that the supports can pass through the spaces between the conveyor belts, cutting the strip transversely to said conveyor while supported by the supports so as to form individual brick mouldings, redepositing the cut mouldings on the conveyor by again causing relative vertical movement between the conveyor and the table and conveying the cut mouldings away from the cutting position in the same direction as when fed into the cutting position while substantially simultaneously conveying another uncut strip into the specific cutting position.

10. An apparatus suitable for use in cutting brick mouldings from a strip comprising a conveyor for moving in a first direction having spaced apart conveyor belts for conveying the strip into a specific position and for conveying therefrom brick mouldings cut from the strip, a table comprised of a plurality of supports, for supporting the strip, which can pass through the spaces between the spaced apart conveyor belts, the conveyor



and the table being relatively vertically movable so that the strip can be transferred back and forth between the conveyor and the table, a cutting frame having at least one cutting wire extending transversely to said conveyor and being tensioned in one plane, the supports being spaced apart in said first direction to allow said at least one cutting wire to pass therebetween, first drive means for driving the conveyor, second drive means to cause the relative vertical movement between said conveyor and said table and third drive means for moving the cutting frame to effect cutting and for returning the cutting frame to its starting position after cutting.

4,311,074

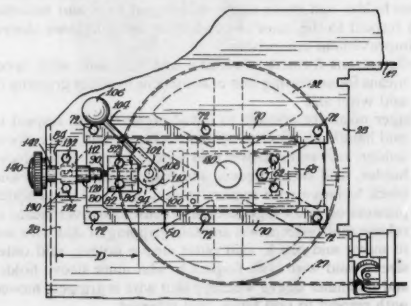
BAND SAW BLADE TIGHTENING DEVICE

Timothy C. Titus, Three Rivers, Mich., assignor to Wells Manufacturing Corporation, Three Rivers, Mich.

Filed Jan. 3, 1980, Ser. No. 109,254

Int. Cl.³ B26D *1/48*; B27B *13/08*

U.S. Cl. 83—816 **10 Claims**



1. In a band saw having a frame, spaced-apart band wheels rotatably mounted to said frame in a common plane of rotation and adapted to receive and carry an endless band saw blade thereon, a blade drive means operably associated with one of said band wheels to drive that band wheel, and another of said band wheels being an idler wheel and additionally being mounted for movement in said plane of rotation relative to said driven band wheel to tension said endless band saw blade, an improved blade tensioning mechanism which comprises:

a block slidably mounted to said frame and carrying said idler band wheel rotatably mounted thereon;

an apertured cam follower integral with said block;

a threaded, elongated link having a distal end extending through said apertured cam follower;

detent means mounted on said link for engaging said block;

link receiving means carried by said frame and threadingly engaged with said link, said link receiving means being braced against displacement relative to said frame, but rotatably mounted relative to said frame and link;

a handle for rotating said link receiving means thereby effecting displacement of said threadingly engaged link and of said detent means relative to said frame along the lingitudinal axis of the link to move said block and pretension said band saw blade;

torque limiting means operably disposed between said handle and said link receiving means for accommodating rotation of said link receiving means by said handle only until a predetermined torque value is attained; and

cam means mounted on said link distal end for engaging said cam follower to displace said block a predetermined distance along the longitudinal axis of said link thereby tensioning said band saw blade to operational tension.

4,311,075

CUTTING TOOL

Erik W. Sundström, Sandviken, Sweden, assignor to Sanvik Aktiebolag, Sandviken, Sweden

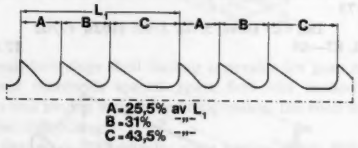
PCT No. PCT/SE79/00007, § 371 Date Sep. 7, 1979, § 102(e) Date Sep. 7, 1979, PCT Pub. No. WO79/00498, PCT Pub. Date Aug. 9, 1979

PCT Filed Jan. 11, 1979, Ser. No. 170,674

Claims priority, application Sweden, Jan. 12, 1978, 7800340

Int. Cl.³ B23D *57/00;* B26D *1/12*

U.S. Cl. 83—848 **5 Claims**



1. A cutting tool having cutting elements arranged in recurrent groups of three elements, a first pair of adjacent elements in a group spaced from one another by a first distance; a second pair of adjacent elements in said group spaced from one another by a second distance; the trailing element of said group being spaced from a leading element of a subsequent group by a third distance; said first, second and third distances being all different from each other and each being expressed as a percentage of a period length of said group wherein one of said distances lies within the range of from 17 to 28.5 percent, another of said distances lies within the range of from 28 to 36 percent, and the remaining one of said distances lies within the range of from 40.5 to 50 percent.

4,311,076

ELECTRONIC MUSICAL INSTRUMENT WITH HARMONY GENERATION

Thomas E. Rucktenwald, Schaumburg; William E. Braun, Jr., Chicago; Louis S. Lazare; Sharming Lin, both of Skokie, and Byron Melcher, Arlington Heights, all of Ill., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 7, 1980, Ser. No. 110,384

Int. Cl.³ G10H *1/22, 1/40*

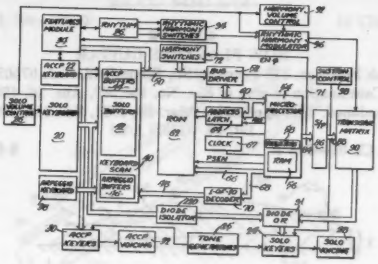
U.S. Cl. 84—1.03 **55 Claims**

1. An electronic musical instrument for automatically generating notes related to other notes selected by an individual playing the instrument, comprising:

keyboard means having a plurality of keys corresponding to notes of the musical scale with at least a portion corresponding to solo notes and a portion corresponding to accompaniment notes;

voicing means for sounding solo notes;

harmony switch means for selecting a plurality of harmony modes including at least one harmony mode for producing a single harmony note and at least one harmony mode for producing plural harmony notes for identical actuations of the keyboard means;



processing means responsive to said keyboard means and said harmony switch means for generating at least one harmony note having a frequency interval displaceable with respect to the highest solo note in accordance with the mode selected on the harmony switch means; the harmony note sounding with said solo voicing.

4,311,077

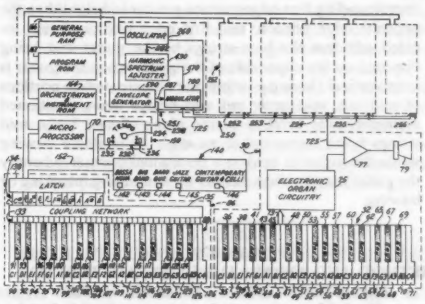
ELECTRONIC MUSICAL INSTRUMENT CHORD CORRECTION TECHNIQUES

Robert J. Hall, Chatsworth, Calif., assignor to Norlin Industries, Inc., White Plains, N.Y.

Filed Jun. 4, 1980, Ser. No. 156,473

Int. Cl.³ G10H *1/42, 7/00*

U.S. Cl. 84—1.03 **14 Claims**



1. In an electronic musical instrument for enabling a performer to control the production of a musical accompaniment defined in part by rhythmic beats having a period, said instrument including harmony selection means for enabling the performer to select a plurality of different harmonies, apparatus for improving the quality of the accompaniment produced in response to unskilled manipulation of the instrument by the performer comprising in combination:

means for dividing the period of at least some of the beats into at least a first time segment and a second time segment occurring later in the beat than the first time segment;

means responsive to the selection of said different harmonies for generating a segment of music, said responsive means being operative during the first time segment for modifying the segment of music in response to a change in the selected harmony and operative during the second time

segment for inhibiting modification of the segment of music in response to a change in the selected harmony, whereby the performer can change to a different harmony at the end of a beat without interrupting the continuity of the musical segment and can hear at least a portion of the subsequent beat in the changed harmony even if the change is not completed until a portion of the subsequent beat has elapsed.

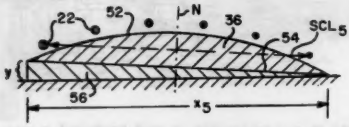
4,311,078
BOW PLAYABLE GUITAR

Frank Falgares, 238 Franklin St., Bloomfield, N.J. 07603

Continuation-in-part of Ser. No. 140,297, Apr. 14, 1980, abandoned. This application Mar. 30, 1981, Ser. No. 249,181

Int. Cl.³ G10D *3/06*

U.S. Cl. 84—314 R **8 Claims**



1. In a guitar having a head portion with tuning pegs, a neck having a fingerboard, a nut at one end of the neck adjacent the head, a body portion, an anchor tail piece on the body and a bridge on said body between the tail piece and the other end of the neck, with a plurality of strings ranging from bass to treble extending between the tuning pegs and the tail piece and over the nut and bridge, wherein the improvement comprises:

(a) said nut, said neck and said bridge each having an arcuate surface portion;

(b) said nut and said bridge each further having recesses for receiving portions of said strings to support said strings in a spaced apart and an arcuate disposition relative to the arcuate surface portion of said neck; and

(c) said nut, said neck and said bridge each further having a corresponding first edge portion greater in height than the opposite edge portion, said first edge portions being located adjacent the bass strings of the guitar and being disposed on the upper side of the guitar when the guitar is in its vertical playing position, the arcuate surface portions of said nut, said neck and said bridge being positioned asymmetrically relative to the plane of said body, said strings being supported at an angle to facilitate bowing while the guitar is held in a traditional manner whereby the guitar may be played either by strumming, plucking or bowing.

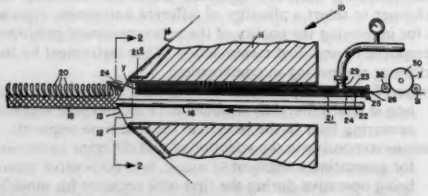
4,311,079
METHOD AND APPARATUS USING AIR JETS FOR MANUFACTURING FAIRED ARTICLES

Henry A. Hood, Moorestown, N.J., assignor to Wall Industries, Inc., Beverly, N.J.

Filed Aug. 25, 1980, Ser. No. 181,182

Int. Cl.³ D04C *1/12, 3/12*; D07B *1/14*

U.S. Cl. 87—6 **11 Claims**



1. In a method of manufacturing a faired article wherein fairing yarn loops are applied during braiding of a jacket as the jacket exits downstream from the ring of a braider, the improvement comprising the steps of:

guiding at least one length of a fairing yarn into proximity with the upstream side of the braider ring;

entraining said fairing yarn in a fluid stream directed across the path of movement of the braid yarns as they advance around the braider ring; and

causing the fluid stream with said fairing yarn entrained therein to pass through the path of movement of the braid yarns as they advance and thereby enabling the braid yarns to form the fairing yarn into loops extending along the jacket structure.

7. In combination with a braider having a braider ring for guiding braid yarns in a conical path to form a braided structure, apparatus for forming a series of fairings along the braided structure, said apparatus comprising:

means for guiding at least one length of fairing yarn into close proximity with the path of movement of said braid yarns inwardly of said braider ring; and

means providing a fluid jet adjacent said braider ring for entraining said fairing yarn and displacing the same through the braid yarns inwardly of said braider ring as the braid yarns advance;

whereby a series of fairing loops are provided along the length of the braided structure as it advances away from the braider.

4,311,080
DRIVE MECHANISM

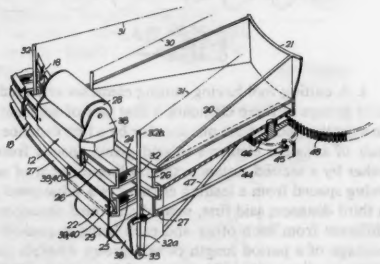
Ian C. A. Leonard, Bolton, England, assignor to National Research Development Corporation, London, England

Division of Ser. No. 748,402, Dec. 8, 1976. This application Jun. 20, 1977, Ser. No. 808,347

Claims priority, application United Kingdom, Dec. 10, 1975, 50546/75

Int. Cl.³ D04C *3/02, 3/06*; H02K *41/02*

U.S. Cl. 87—44 **17 Claims**



1. A drive mechanism for driving at least one displaceable element to move around a closed path, comprising:

means constraining the at least one displaceable element to move around said closed path;

a linear induction actuator extending adjacent said closed path and substantially entirely around it, said linear induction actuator comprising a plurality of separate arcuate electrically interconnected windings separated circumferentially by respective air gaps; and

a reaction member carried by said at least one displaceable element and extending circumferentially over part only of any one said winding, said reaction member cooperating with the linear induction actuator whereby when said linear induction actuator is appropriately energized, said at least one displaceable element is driven around said closed path.

8. A braiding machine incorporating a drive mechanism as in claim 1, including a first set of carriages formed by a plurality of displaceable elements;

means constraining said first set of carriages to move around a circular path;

a second set of carriages;

means constraining said second set of carriages to move around a circular path;

a plurality of spools of filaments carried one on each of said carriages of said first and second set;

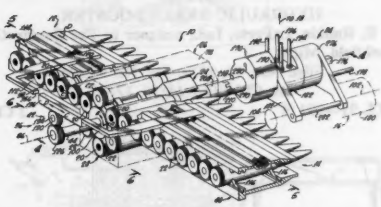
means for guiding filaments drawn from said spools carried by said carriage of said first set over and under filaments drawn from said spools carried by said carriages of said second set, with respect to an axis passing through both centres of said circular paths of said first and second sets of carriages.

4,311,081

DUAL, TWO STAGE SHELL FEEDING APPARATUS FOR GUNS

Richard R. Gillum, Marblehead, Ohio, assignor to ARES, Inc., Port Clinton, Ohio

Filed Feb. 5, 1980, Ser. No. 118,763
Int. Cl.³ F41D *10/32*
U.S. Cl. 89—33 SF **24 Claims**



1. Dual, two stage shell feeding apparatus for guns having associated therewith spaced apart first and second shell supplies and having a shell loading position, the shell feeding apparatus comprising:

(a) a first stage shell transfer rotor having means defining a plurality of peripheral shell holding cavities,

the shell rotor cavity defining means defining a first set of cavities, comprising a plurality of first shell holding cavities, for transferring shells from the first shell supply to the loading position and a second set of cavities, comprising a plurality of second shell holding cavities, for transferring shells from the second shell supply to the loading position, said first and second shell holding cavities being alternatively arranged around the rotor;

(b) means rotatably mounting the rotor between the first and second shell supplies and the shell loading position to enable rotational transfer of shells from each one of the shell supplies to the shell loading position,

said mounting means mounting the rotor relative to the first and second shell supplies and the shell loading position to cause, whenever one of the rotor cavities is in shell receiving relationship with a selected one of the shell supplies, another one of the cavities to be in the shell loading position;

(c) means for rotatably indexing the rotor in one rotational direction to transfer shells from the first shell supply to the shell loading position and in an opposite rotational direction to transfer shells from the second shell supply to the shell loading position,

said rotor indexing means including selector means for selecting between the sets of cavities to be used for shell transferring and hence for selecting between feeding from the two shell supplies; and,

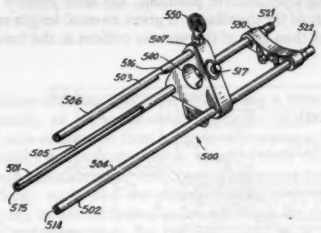
(d) second stage means for transferring shells from said shell supplies into the rotor cavities.

4,311,082

GENERAL PURPOSE AUTOMATIC WEAPON SYSTEM

Curtis D. Johnson, Wharton, and Philip L. Baker, Ogdensburg, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 48,105, Jun. 13, 1979, abandoned. This application Apr. 20, 1981, Ser. No. 255,582
Int. Cl.³ F41D *5/04*
U.S. Cl. 89—191 R **18 Claims**



1. A gas operated gun comprising:

a gun barrel adapted to contain a gas under pressure for propelling a projectile through said barrel,

a receiver having three elongate substantially parallel hollow tubes in a triangular pattern of relationship, each of said tubes having oppositively directed fore and aft ends, one of said tubes being uppermost and two of said tubes being lowermost and mutually coplanar, said receiver further having rear and front end cap means connected to each of said tubes for securing said tubes fixedly in said triangular relationship, said front end cap means having means for securing said gun barrel between said tubes,

elongate force-transmitting means including operating rods longitudinally movable within each of said two lowermost tubes,

gas cylinder means connected between said gun barrel and said force transmitting means in each of said two lowermost tubes, for applying force generated from said gas under pressure to said force-transmitting means, and

a bolt carrier assembly slidably mounted on one of said tubes uppermost in relation to said lowermost tubes, said bolt carrier assembly being adapted to move a cartridge into said barrel to fire said cartridge and be forced rearwardly toward said rear end cap means by said force-transmitting means during recoil after said cartridge is fired.

4,311,083

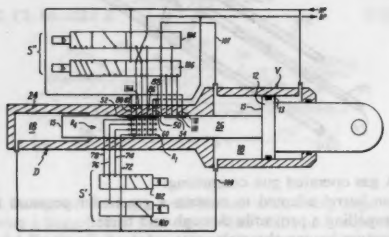
ABSOLUTE-CONTROL NUMERICAL HYDRAULIC ACTUATING DEVICE

Marcel Guillon, Issy-les-Moulineaux, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Oct. 1, 1979, Ser. No. 80,893
Claims priority, application France, Oct. 5, 1978, 78 28548
Int. Cl.³ F15B *15/17*; F01B *25/02*
U.S. Cl. 91—19 **2 Claims**

1. A numerical hydraulic actuating device for absolute-control of an output position for a piston, comprising a distributor having a moving part connected to the piston and comprising at least one land portion which moves along a main row of distributor orifices formed in a stationary part of the distributor so as to cover them in succession, the device also comprising a numerically-actuated selector means connected to the various orifices in order to selectively establish hydraulic connections required to produce a certain number of discrete coarse locking positions of the piston, the piston which is of the differential kind having on one side a chamber of a small cross-section permanently connected to a high-pressure source which supplies fluid to the device, and on the other side forming an active chamber of a larger cross-section which is supplied with fluid at a variable pressure from the distributor, the land por-

tion of the movable part of the distributor being bounded by the ends of two aligned longitudinal grooves which are communicated with the high-pressure source and with a low-pressure source respectively, and the distributor orifices which are formed along a corresponding generatrix of the stationary part being spaced axially from one another in a number equal to that of the wanted locking positions and being each connectable through the selector means to the active chamber whereas the remaining orifices are disconnected, the improvement wherein, in order to increase the number of locking positions by providing intermediate positions, the land portion of the movable part of the distributor is given an axial length substantially greater than that of the various orifices in the main row,



that, in addition to the main row of distributor orifices, the stationary part of the distributor is formed with a number of auxiliary rows made up of collecting orifices which can be selectively connected by the selector means to the active chamber and alternate with fluid orifices which in turn can be selectively connected to the high-pressure and low-pressure sources, and that the auxiliary rows of orifices aligned along separate generatrices of the stationary part of the distributor cooperate with an equal number of longitudinal grooves formed along corresponding generatrices of the movable part to define fine locking positions of the piston, starting from the coarse positions of the piston obtained by means of the main row of distributor orifices.

4,311,084

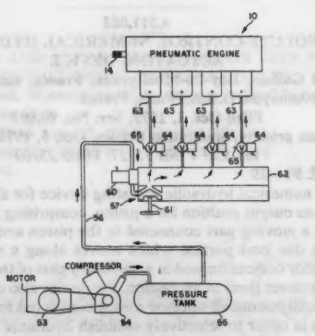
PNEUMATIC ENGINE

Richard V. Pierce, 2605 Hadley St., St. Louis, Mo. 63106

Filed Jan. 4, 1980, Ser. No. 109,601

Int. Cl.³ F01L *33/02*; F15B *13/044*

U.S. Cl. 91—188 **4 Claims**



1. A compressed air engine comprising:

(a) a throttle means,

(b) means operatively connected to the throttle means for providing compressed air to the throttle means,

(c) at least two cylinders each having a reciprocating piston therein,

(d) means operatively connecting the throttle means to the cylinders for providing compressed air from the throttle means to the cylinders to drive the pistons,

(e) a crankshaft coupled to said pistons, and rotatively driven in response to the reciprocating motion of said pistons,

(f) means operatively connected between the throttle means and cylinders for selectively interrupting the flow of compressed air to at least one of the cylinders while allowing compressed air to at least one other cylinder,

(g) each cylinder including an inlet valve for allowing compressed air into the cylinder during a power stroke and preventing compressed air from entering the cylinder during an exhaust stroke,

(h) each of the cylinders including an exhaust valve connecting the cylinder to atmosphere during the exhaust stroke and closing the connection to low pressure during the power stroke, and

(i) the selective interrupting means comprising two-way valves which selectively disconnecting the flow of compressed air to the said one cylinder while allowing the inlet valve of the same cylinder to communicate with atmosphere when the compressed air is disconnected.

4,311,085

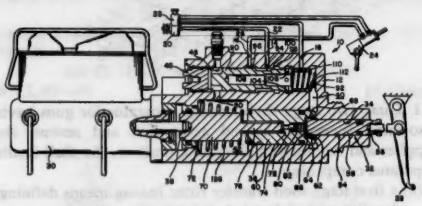
HYDRAULIC BRAKE BOOSTER

Dean E. Runkle, LaPorte, Ind., assignor to The Bendix Corp., Southfield, Mich.

Filed Nov. 16, 1979, Ser. No. 95,034

Int. Cl.³ F15B *13/10, 17/02*

U.S. Cl. 91—391 R **2 Claims**



1. In a hydraulic brake booster, a housing having an input member extending into the housing and an output member extending outwardly of the housing, a valve member carried by the housing to control communication of fluid pressure from a pressure source through the housing via an inlet and an outlet on the housing, the input member being movable within the housing to control movement of the valve member, the housing substantially defining a first pressure chamber and a second pressure chamber, movement of the valve member communicating the inlet with the first pressure chamber to communicate fluid pressure from the pressure source thereto, characterized by said input member extending through said first pressure chamber and being exposed to said second pressure chamber, said input member being movable within the housing to generate fluid pressure within said second pressure chamber, the generated fluid pressure within the second pressure chamber being in communication with the valve member to actuate the latter, the actuated valve member cooperating with the housing to define a fluid path for communicating fluid pressure from the pressure source to said first pressure chamber wherein the fluid pressure acts against the input member to bias the same toward the second pressure chamber, said output member being movable in response to the generated fluid pressure in the second pressure chamber, said input member substantially defining a fluid passage extending from said first pressure chamber to said second pressure chamber and a one-way valve disposed within said fluid passage only permits fluid communication from said second pressure chamber to said first pressure chamber, and said fluid passage receiving a portion of

said output member which is movable within said fluid passage.

4,311,086

SYSTEM FOR DAMPING ABRUPT MOVEMENT OF A PUNCH PRESS RAM

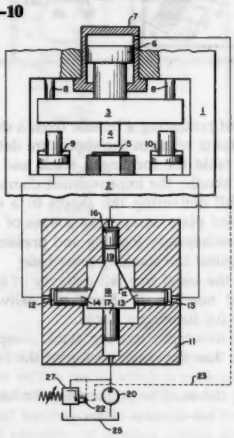
Hans Schoen, Lange Horst 87, 4320 Hattingen, Fed. Rep. of Germany

Filed Mar. 19, 1980, Ser. No. 131,582

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1979, 2911820

Int. Cl.³ F15B *15/22*

U.S. Cl. 92—10 4 Claims



1. In a system for damping abrupt movement of a punch press ram at the moment of cut-breakthrough with the use of at least two damping ram-type pistons disposed within cylinders and arranged to engage the press ram during cut-breakthrough; the improvement of means for controlling the pressure in said cylinders and the damping effect of said cylinders, which comprises a movable wedge-shaped member having an upper surface, a lower surface and inclined side surfaces converging toward said upper surfaces, first and second coaxial pistons disposed within cylinders and having inclined end surfaces in contact with the inclined side surfaces of said wedge-shaped member, conduit means connecting the cylinders of the coaxial first and second pistons to the respective cylinders for said ram-type damping pistons, a third piston in engagement with the upper surface of the wedge-shaped member and disposed within a cylinder which is subjected to a pressure dependent upon the pressure exerted by said ram, a fourth piston in engagement with the lower surface of said wedge-shaped member and disposed within a cylinder, and a source of fluid under pressure connected to said last-named cylinder, the arrangement being such that as the ram forces a tool through a workpiece, the third piston will force the wedge-shaped member downwardly to permit the first and second pistons to move toward each other and cause the damping ram-type pistons to yield in synchronism with the ram until the instant of cut-breakthrough, whereupon the pressure exerted by said third piston on the wedge-shaped member drops and the damping ram-type pistons act as rigid bodies and prevent abrupt breakthrough movement of the ram.

4,311,087

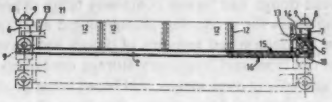
CHEESE-DRAINING APPARATUS

Gerrit E. Brinkman, La Celle-St-Cloud, France, assignor to Alfa-Laval S.A., Les Clayes Sous Bois, France

Filed Feb. 19, 1980, Ser. No. 122,616

Int. Cl.³ A01J *25/13*

U.S. Cl. 99—456 9 Claims



1. Cheese-draining apparatus comprising a table formed by an assembly of separable table elements interconnected in side-by-side relation to form a group of draining surfaces lying substantially in a common plane, a multi-cavity mold coacting with each table element, and connecting means between each multi-cavity mold and the corresponding table element, the connecting means including means allowing the mold to slide toward and away from the corresponding table element between a normal position of use for draining, wherein the mold rests on the table element, and a cleaning position wherein the mold is spaced from the table element, the connecting means also including abutments for limiting said sliding of the mold and on which the mold is supported in said cleaning position thereof.

4,311,088

ARRANGEMENT FOR BAKING DRY FLAT BREAD

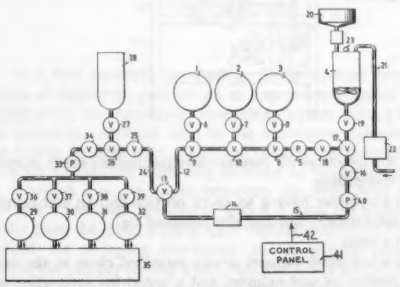
Karl Höhn, Neuköllnische Allee 54, D-1000 Berlin 44; Olaf Höhn, Auguststrasse 16, D-1000 Berlin 45, and Wolfgang Höhn, Neuköllnische Allee 54, D-1000 Berlin 44, all of Fed. Rep. of Germany

Division of Ser. No. 957,354, Nov. 3, 1978. This application Sep. 27, 1979, Ser. No. 79,319

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1977, 2750358

Int. Cl.³ A21D *2/00, 10/00*

U.S. Cl. 99—470 4 Claims



1. An apparatus for producing dry flat bread from dough having only water and flour with addition of leaven comprising: three leaven storage tanks for biological leaven production, one mixing tank for preparing either leaven or baking dough, one baking dough storage tank, automatic baking oven means with containers for temporary storage, said baking dough storage tank supplying said containers; a pipeline network for connecting by remote controlled valve means said leaven storage tanks to said mixing tank, said mixing tank to said baking dough storage tank, and said baking dough storage tank to said temporary storage containers; a heat exchanger and a cooler in said pipeline network located between said mixing tank and said leaven storage tanks, said heat exchanger

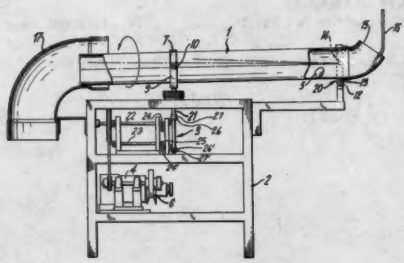
and cooler further located between said mixing tank and said baking dough storage tank; each of said leaven storage tank, baking dough storage tank, mixing tank, temporary storage containers, heat exchanger and cooler comprising processing stations; and a central control panel for controlling said processing stations, said leaven being maintained in said storage tanks for a predetermined period of time at a defined temperature within a predetermined temperature range, the capacities of the bread-dough and leaven containers being dependent on processing times for producing uninterrupted and continuous operation, predetermined amounts of dough and leaven being portioned out from said temporary storage containers prior to entering said baking oven means, said bread being produced by spontaneous chemical fermentation free from the use of bacteria.

4,311,089

METHOD AND APPARATUS FOR PEELING OF SHELLS OF BOILED EGGS

Noriomi Fujii, Isehara, Japan, assignor to Q. P. Corporation, Tokyo, Japan

Filed Nov. 5, 1979, Ser. No. 90,899
Int. Cl.[3] A23N *5/00, 7/00*
U.S. Cl. 99—568 2 Claims



1. An apparatus for continuously peeling the shells of boiled eggs comprising

(a) a cylinder having an entry portion and an exit portion, substantially horizontally mounted on

(b) a base;

(c) a universal support device mounted close to the entry portion of said cylinder and adapted for supporting said cylinder on said base in a manner to permit said cylinder to tilt in any desired direction;

(d) an eccentric device provided further toward the exit end of said cylinder from said universal support device and adapted for supporting said cylinder on said base for imparting to the exit end portion of said cylinder a gyratory circular movement about a substantially horizontal axis;

(e) a means for driving said eccentric device;

(f) a water source for introducing flush water to said cylinder; and

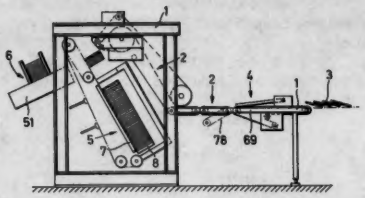
(g) a boiled egg receiver means for receiving and separating the peeled boiled egg and the shell components flushed from the exit end of said cylinder.

4,311,090

METHOD PRODUCING A BUNDLE OF PAPER SHEETS

Ernst Dudziak, Harsewinkel; Gerd-Georg Kwauka, Gutersloh; Arthur Plate, Lubbecke, and Hermann Lübeck, Espelkamp-Frotheim, all of Fed. Rep. of Germany, assignors to Reinhard Mohn OHG, Gutersloh, Fed. Rep. of Germany

Filed Nov. 22, 1978, Ser. No. 963,125
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1977, 2753048; Apr. 27, 1978, 2818463
Int. Cl.[3] B65B *13/02*
U.S. Cl. 100—3 15 Claims



1. In a method of producing a bundle from a sheet-by-sheet stream of paper sheets wherein the sheets are delivered to an inclined stacking table for forming a stack and the stack is banded to form a bundle; the improvement comprising:

(a) serial free fall delivering the sheets to a downwardly moving inclined plate comprising a base of the stacking table while continuously jogging and pressing the delivered sheets against the stacking table base;

(b) interrupting the serial free fall delivery of sheets after a predetermined number of sheets are delivered to the stacking table for forming a stack;

(c) placing a downwardly moving stack compressor plate moving faster than the stack on top of the formed stack; and

(d) compressing the stack in preparation for banding.

4,311,091

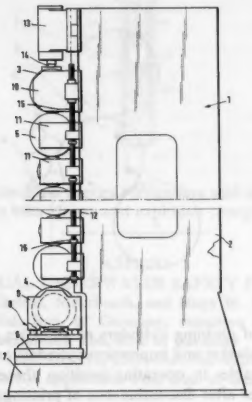
RAPID-SEPARATION MOUNTING ARRANGEMENT FOR ROLLERS OF A CALENDERING MACHINE

Joseph Pav, and Reinhard Wenzel, both of Krefeld, Fed. Rep. of Germany, assignors to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

Filed Jul. 3, 1979, Ser. No. 54,614
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1978, 2830733
Int. Cl.[3] B30B *3/04*
U.S. Cl. 100—161 12 Claims

1. A machine for treating elongated webs of flexible material, particularly for calendering paper webs, comprising a support; elongated guiding means provided on said support and extending in a substantially vertical direction; a plurality of treating rollers; means for mounting said treating rollers above each other on said guiding means for displacement longitudinally of the latter; an additional treating roller; a pair of similar structural units spaced from one another, as considered in the axial direction of said additional treating roller, and mounted below said plurality of treating rollers in the operative positions thereof, each of said units including first means for mounting and guiding said additional treating roller on said support for displacement in substantial parallelism with said direction and second means for displacing at least said additional treating roller at least upwardly toward the lowermost of said plurality of treating rollers, said first means including at least two guides in each of said structural units and each situated at one side of the axis of said additional treating roller, said mounting and said first means including two bearing blocks for each of said treating rollers and said first means of each of said structural units incorporating one of the bearing blocks for said additional treating roller; means mounted on said support and

operative to urge the bearing blocks for the uppermost roller of said plurality of treating rollers downwardly, the bearing blocks for said plurality of treating rollers being freely displaceably mounted on said guiding means for gradual entrainment of said plurality of treating rollers for joint displacement with said additional treating roller and with one another in upward direction, each of said second means including a cylinder-and-piston unit including a cylinder member and a piston member, one of said members being stationary relative to said support and the other of said members being movable relative to said support and acting on the bearing block of the respective structural unit, and means for admitting a pressurized fluid



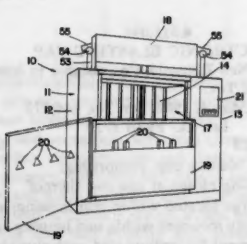
medium into the cylinder member to act on the respective other member with a force which is sufficient to displace the respective other member upwardly and to thereby displace said additional treating roller toward the lowermost treating roller of said plurality of treating rollers and then gradually displace said plurality of treating rollers toward one another, and for relieving the pressure in the cylinder member to thus allow said treating rollers to gradually and rapidly assume spaced-apart positions in which gaps are present between said treating rollers; and means for limiting the extent of upward displacement of at least one of said treating rollers, said limiting means being incorporated in at least one of said structural units.

4,311,092

LOW-PROFILE VERTICAL BALING MACHINE

Frank C. Tea, Bellevue, Ohio, assignor to The American Baler Company, Bellevue, Ohio

Filed Dec. 19, 1979, Ser. No. 105,225
Int. Cl.³ B30B *15/06*
U.S. Cl. 100—214 **14 Claims**



1. A baling machine which comprises:

a baling chamber;

a vertically extending support column horizontally spaced from the baling chamber;

an elongated sleeve mounted around the support column and vertically movable thereon;

a platen vertically movable within the baling chamber between an upper position and a lower position, said lower position being approximately at the mid-point of the length of the baling chamber, the platen mounted on the sleeve and supported thereby, the sleeve extending below the bottom of the platen, the length of the sleeve below the bottom of the platen being substantially as long as the distance between the bottom of the platen and the bottom of the baling chamber when the platen is in the lower position; and

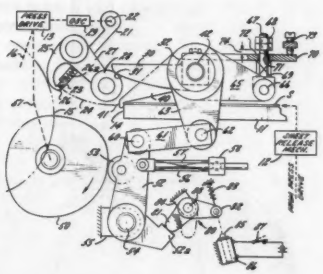
ram means for vertically moving the platen, the ram means horizontally spaced from the baling chamber and operatively connected to the platen.

4,311,093

SHEET FEEDING ASSEMBLY INCLUDING PROVISION FOR COORDINATED ACTION OF PRE-GRIPPER AND FRONT STOP

Paul Abendroth, and Helmust Emrich, both of Offenbach am Main, Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 6, 1979, Ser. No. 64,082
Int. Cl.³ B41F *21/06*
U.S. Cl. 101—232 **4 Claims**



1. In a feed assembly for feeding sheets seriatim from a position of register to grippers on an impression cylinder in a printing press, the combination comprising a press drive, a feed table presenting its front edge to the impression cylinder, a front stop at the front edge of the feed table having positioning means for moving the front stop between an interposed position in which it registeringly intercepts the front edge of a sheet and a retracted position in which it frees the sheet for transfer from the table, a pre-gripper assembly having a frame mounted for swinging movement and a gripper pivoted thereon, the gripper having a movable jaw and a jaw lever in the form of a cam follower for operating the jaw, the pre-gripper frame having an oscillating connection with the press drive so that the jaw is periodically swung from a sheet pick-up position at the front edge of the table to a sheet-releasing position at the surface of the impression cylinder, a gripper operating cam arranged in the path of movement of the jaw lever and mounted for retreating and return movement with respect thereto, a rotary control cam coupled to the press drive and having a control cam follower, linkage connecting the control cam follower to the gripper operating cam for controlling the retreating and return movement of the gripper operating cam so that the jaw is open and subsequently closed upon the edge of the awaiting sheet upon reaching the pick-up position, and means including a phasing connection for drivingly coupling the linkage to the front stop positioning means with such phasing that the front stop is moved to a retracted posi-

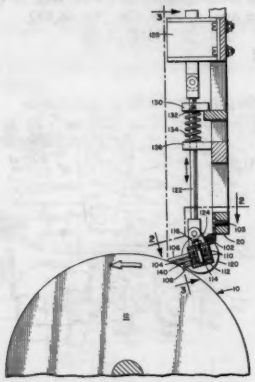
tion to free the sheet timed with closure of the jaw upon the sheet.

4,311,094

METHOD AND APPARATUS FOR REMOVING FOREIGN MATTER FROM A PRINTING PRESS PLATE CYLINDER

Lloyd W. Ellison, P.O. Box 126, Jupiter, Fla. 33458

Filed Mar. 12, 1979, Ser. No. 19,336
Int. Cl.[3] B41F *35/00*; B41L *41/00*
U.S. Cl. 101—425 11 Claims



1. Apparatus for quickly removing particles of foreign matter adhering to the surface of an image-bearing printing plate mounted on the periphery of a rotating plate cylinder of a rotary printing press while the press is operating, said apparatus comprising:

a support member;

a flexible, cantilevered wiping blade rigidly affixed to said support member;

a separate flexible, cantilevered sweeping blade rigidly affixed to said support member adjacent to said wiping blade and immediately therebehind in relation to the direction of movement of said printing plate surface, said sweeping blade extending from said support a greater distance than said wiping blade; and

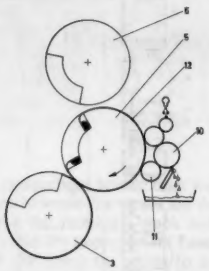
operating means connected to said support member for selectively moving said blades into and out of contact with the surface of said printing plate during rotation of the plate cylinder, said blades extending away from said printing plate at acute angles with the advancing surface of said printing plate when said blades are in contact with said surface, whereby said wiping blade wipes said printing plate surface to spread and thin ink on said surface and expose said particles, and said sweeping blade immediately sweeps the surface wiped by said wiping blade to disturb and dislodge the exposed particles.

4,311,095

CLEANING DEVICE FOR PRINTING-UNIT CYLINDERS IN OFFSET PRINTING MACHINES

Willi Jeschke, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Continuation of Ser. No. 897,844, Apr. 19, 1978, abandoned, which is a continuation of Ser. No. 706,064, Jul. 16, 1976, abandoned. This application Jun. 15, 1979, Ser. No. 48,898
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1975, 2531886
Int. Cl.[3] B41F *35/00*
U.S. Cl. 101—426 3 Claims



1. Method of cleaning cylinders of an offset printing unit having plate, blanket and impression cylinders and a washing device engageable, in operating position thereof, with the blanket cylinder after discontinuance of printing by the printing unit, the printing unit being operated without paper feed and with the blanket cylinder rotating while disengaged from the impression cylinder and the plate cylinder, which comprises applying washing liquid with the washing device to the rotating blanket cylinder while the blanket cylinder is disengaged from the impression cylinder and the plate cylinder so as to clean the blanket cylinder to remove most or substantially all foreign material accumulated thereon, engaging the blanket cylinder with at least one of the plate and impression cylinders, and continuing to apply washing liquid with the washing device to the blanket cylinder so as to clean the blanket cylinder and the at least one of the plate and impression cylinders engaged therewith.

4,311,096

ELECTRONIC BLASTING CAP

Gerald L. Oswald, New Ringgold, Pa., assignor to Atlas Powder Company, Dallas, Tex.

Filed May 5, 1980, Ser. No. 146,272
Int. Cl.[3] F42B *3/16*
U.S. Cl. 102—202.13 46 Claims

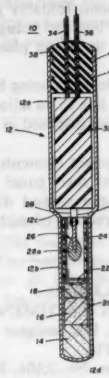
1. An electronic blasting cap, comprising:

an elongate housing closed at one end thereof;

an explosive charge located within said housing; an electric ignition assembly mounted within said housing and having an ignition element for igniting said explosive charge; and

an electronic module located within said housing and connected to receive an externally supplied signal through a firing line for storing electrical energy in said electronic

module, said electric ignition assembly connected to said electronic module for receiving at least a part of said



stored electrical energy for igniting said ignition element which in turn ignites said explosive charge.

4,311,097

DUAL UNDERWATER SAFETY FUSE

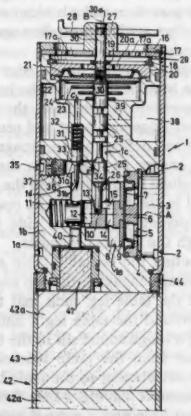
Guenter Backstein, Meerbusch, and Hans W. Unger, Krefeld, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 10, 1979, Ser. No. 83,386

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1978, 2844188

Int. Cl.³ F42C *3/00, 5/00*

U.S. Cl. 102—229 **18 Claims**



1. A pressure-actuated fuse apparatus comprising: a housing forming primary and secondary compartments; respective primary and secondary fuses including

primary and secondary actuating elements exposed in the respective compartments and displaceable along respective primary and secondary axes in said housing between outer and inner positions, said axes being transverse, and

primary and secondary spring means braced between said housing and said primary and secondary elements for urging same into their outer positions and for permitting same to move into their inner positions when the respective compartments are at respective primary and secondary pressures, said pressures being substantially different from each other;

a detonator mounted in said housing;

a firing member in said housing displaceable into a firing position engaging and exploding said detonator;

primary link means for blocking said secondary element from moving into the respective inner position except when said primary element is in the respective inner position; and

secondary link means for blocking said firing member from moving into said firing position except when said secondary element is in the respective inner position.

4,311,098

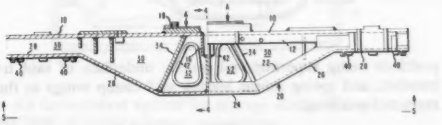
RAILWAY CAR TRUCK BOLSTER

Howard D. Irwin, Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Feb. 19, 1980, Ser. No. 122,725

Int. Cl.³ B61F *1/00, 5/16*

U.S. Cl. 105—226 **2 Claims**



1. A reinforced I-beam type railway car truck bolster comprising: a compression member horizontally extending the length of the bolster, said compression member having a centrally located center bearing; a tension member coextensive with said compression member and spaced therefrom, said tension member having an intermediate horizontal portion merging at opposite ends into diagonally and upwardly and outwardly extending portions, said compression and tension members being of U-shaped cross section with flanges of the respective members extending toward and in alignment with each other; a web having access openings welded centrally between said compression member and said tension member to form an I-beam configuration for the cross section of said bolster; a plurality of welds joining the web, the compression member and the tension member, said welds being disposed to be stressed in shear rather than tension or compression; reinforcing members extending from said compression member below said center bearing at load points of line loads from a car centerplate engaging the center bearing when the car rocks from one side to the other to locations at the opposite ends of the intermediate horizontal portion of the tension member; and flanges welded to the perimeter of said access openings.

4,311,099

LAP TRAY

Judith Roberts, 2 Fox Hollow Ridings Ct., Northport, N.Y. 11768

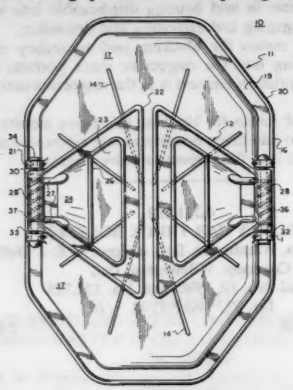
Filed Apr. 28, 1980, Ser. No. 144,183

Int. Cl.³ A47B *5/04, 3/08*; A47C *7/62*

U.S. Cl. 108—47 **6 Claims**

1. A tray device comprising a tray member having opposite longitudinally extending side borders, a pair of longitudinally spaced first hinge knuckles depending from each of said side borders, a pair of clamp wings formed of a synthetic organic polymeric resin and each having integrally formed therewith a handle defining medially disposed convex projection having an access opening at an end thereof, a pair of longitudinally spaced second hinge knuckles formed on the upper edge of each of said clamp wings and aligned with a respective pair of said first hinge knuckles, a hinge pin engaging each set of aligned first and second pairs of hinge knuckles whereby said clamp wings are swingable about respective transversely spaced parallel longitudinal axes proximate said side borders between retracted positions underlying said tray member and

depending advanced positions, the transverse dimension of each of said clamp wings being less than one half the distance between said hinge pins and said clamp wings in their retracted



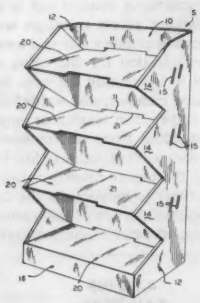
positions being superimposed on the underface of said tray member, and spring means biasing said clamp wings to their retracted positions.

4,311,100

MULTI-SHELF DISPLAY STAND

Jeffrey M. Gardner, Wheaton, and John R. Pieritz, Villa Park, both of Ill., assignors to Container Corporation of America, Chicago, Ill.

Filed Oct. 29, 1979, Ser. No. 89,047
Int. Cl.³ A47B *3/00, 47/06*
U.S. Cl. 108—111 **2 Claims**



1. A multi-shelf, vertical display stand, formed of a unitary tube of foldable paperboard, comprising:

(a) a rear wall having a primary panel and a relatively narrow panel adapted to be secured to said primary panel in overlapping relation to form a unitary tube;

(b) a pair of opposed side walls foldably joined at their rear edges to opposed side edges of said rear wall and extending forwardly therefrom;

(c) each of said side walls presenting a plurality of sloping edges;

(d) a plurality of shelf panels extending normally between said side walls, said shelf-panels having a depth substantially equal to the width of said side walls, each of said shelf panels having a rearwardly extending projection adapted to be received within respective slots disposed in said rear wall;

(e) gusset means foldably joining opposed ends of each of said shelf panels to adjacent sloping edges of respective side walls;

(f) each of said gusset means including a pair of generally triangular gusset elements foldably joined to each other along a common fold line and being adapted to fold inwardly therealong to lie in the plane of said side walls with:

(i) one of said gusset elements being foldably joined along a first diagonal fold line to an adjacent sloping edge of a related side wall and disposed in face to face relation therewith;

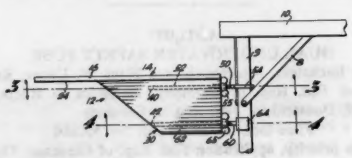
(ii) the other of said gusset elements being formed from material of a related shelf panel and being foldably joined thereto along a second diagonal fold line to accommodate the erection of said display stand from said tube.

4,311,101

TABLE ATTACHMENT

Ignacia de Almagro, Miami, Fla., assignor to Almagro Trading Company, Coral Gables, Fla.

Continuation-in-part of Ser. No. 3,404, Jan. 15, 1979. This application Nov. 1, 1979, Ser. No. 90,411
Int. Cl.³ A47B *57/00, 83/04*
U.S. Cl. 108—152 **2 Claims**



1. An improved table attachment for removably mounting on a table having legs, the attachment comprising:

a base having a top surface and a bottom surface and including two side edges with a centerline spaced equidistance from the side edges,

a support member having an upper edge which is fixedly attached to the bottom surface of the base approximately across the centerline of the base, the support member includes a lower edge and front and rear sides,

the support member defines a top elongate longitudinally threaded hole having an opening in the front side and a bottom longitudinal hole lower than the first and approximately parallel to the first having an opening in the front side and an opening in the rear side thereby the hole extends through the support member,

means for connecting the portable table attachment to the table leg, the means engaging the top and bottom longitudinal hole and the table leg such that the attachment is able to pivot around the table leg a limited distance, the table including a longitudinal slit in the table leg spaced a desired distance from the table wherein the means for connecting the attachment to the table leg comprise:

a first elongate member having a first threaded end which engages the first hole and a second enlarged end which engages the slit in the table leg such that there is freedom for lateral movement of the elongate engaging member and such that the second enlarged end is captivated within the slit in the table leg,

winged nut means threaded on the first end of the elongate engaging member and confronting the front side of the supporting member such that the second end of the elongate engaging member is extended a fixed, but adjustable distance from the front side,

an elongate supporting member having a first threaded end sized for slidable engagement with the second hole in the support member and a second enlarged member sized for mating engagement with the table leg, and

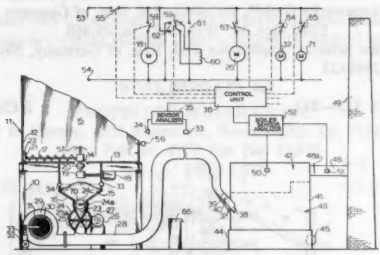
wing nut means threaded on the first end of the elongate supporting member confronting the front surface of the support member and fixing the distance of the second end of the elongate supporting member extends from the front side of the support member.

4,311,102

BURNING SYSTEM

Melvin W. Kolze, 10302 Don Pico Rd., and Bruce A. Kolze, 10356 San Carlos Dr., both of Spring Valley, Calif. 92077

Filed Nov. 28, 1979, Ser. No. 98,122
Int. Cl.³ F23K 3/00
U.S. Cl. 110—103 11 Claims



1. In a particulate waste product firing system which includes: a combination of a storage container and bottom unloader therefor for particulate material having a central opening in the bottom of said container, a radially free-sweeping non-arching conveyor screw rotatable within said container and operable to unload stored particulate material through said opening; a hopper connected to the bottom of said container and disposed immediately below said central opening for receiving discharged particulate material; a sonic control means mounted in said hopper and operably connected to said conveyor screw to selectively vary an amount of particulate material discharged into said hopper in response to a measured accumulation level of particulate material therein; a duct connecting the hopper to a particulate material burning apparatus having two inputs and an exhaust outlet which leads to a stack, the improvement comprising:

a rotary air seal feed interconnected between an opening in the bottom of said hopper and said duct for depositing particulate material in said duct while maintaining air-sealed relation between said hopper and said duct;

a blower having a variable vortex input, said blower connected to said duct for producing an air stream therein for moving said particulate material through said duct to said particulate material burning apparatus;

a steam demand sensor;

a combustion efficiency sensor disposed in said exhaust outlet for providing a feedstock signal in response to a measured combustion parameter therein; and

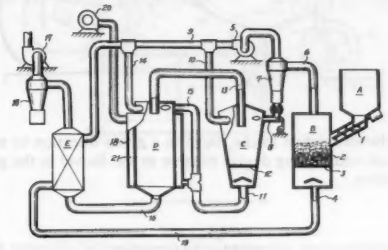
an integrated control unit receiving signals from said sonic control means, said steam demand sensor, and said combustion efficiency sensor and selectively modulating operation of said screw conveyor through a constant speed rotary seal feed, and modulating operating of said lower vortex intake to provide an optimum mount of particulate material input and air input to provide a particulate material-air input to said burning apparatus for optimum combustion thereof and minimization of pollutants.

4,311,103

INCINERATION SYSTEM FOR SEWAGE SLUDGE

Yasuo Hirose, 801-88, Kanagaya, Asahi-ku, Yokohoma City, Kanagawa, Japan

Filed May 6, 1980, Ser. No. 147,411
Claims priority, application Japan, May 16, 1979, 74059072; May 16, 1979, 74059073; May 16, 1979, 74059074; Mar. 7, 1980, 50027986
Int. Cl.³ F23G 7/04
U.S. Cl. 110—238 5 Claims



1. An incineration system for sewage sludge dehydrated to about 70% of water content comprising

a hopper for receiving said sludge,

a drying furnace connected to said hopper by a supplying means for supplying said sludge from said hopper to said furnace, said furnace having a fluidized sand bed, whereby said sludge is dried to a solid component and a gaseous component,

a circular circuit for said gaseous component comprising said drying furnace, a first feed pipe connected to said furance, a heat exchanger connected to said first feed pipe, and a second feed pipe connecting said heat exchanger and said furnace, including means for conveying said solid component along part of said circuit,

a first incinerator connected to said circuit for receiving a portion of said gaseous component and said solid component, for incompletely combusting said components,

means for supplying to said first incinerator preheated air in insufficient quantity to completely combust said components,

a second incinerator connected to said first incinerator for receiving the products of said incomplete combustion and connected to said circuit for receiving another portion of said gaseous component, for completely combusting said gaseous portion and said products of incomplete combustion, and

means for supplying to said second incinerator sufficient preheated air to completely combust said gaseous portion and said products of incomplete combustion, wherein said second incinerator has a discharge means connected to said heat exchanger for discharging the products of said complete combustion to said heat exchanger in which their temperature is reduced.

4,311,104

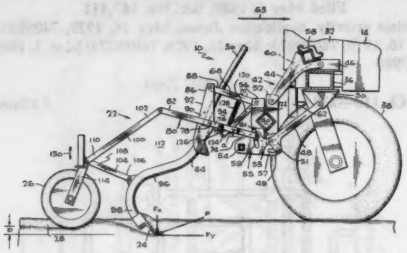
PRESS GRAIN DRILL

Ronald M. Steilen, and Lester D. Schreiner, both of Ankeny, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jan. 21, 1977, Ser. No. 761,247
Int. Cl.³ A01C 5/06
U.S. Cl. 111—85 23 Claims

1. An arrangement for mounting a self-penetrating shovel and a soil compacting device on a frame disposed above the ground in a press grain drill comprising first means movably coupling the shovel to the frame, the first means disposing the shovel at a given pitch relative to the ground and providing for generally up and down movement of the shovel relative to the

frame while substantially maintaining the given pitch, and second means movably coupling the soil compacting device to the shovel, the second means being responsive to movement of



the shovel relative to the frame in a given direction to move the soil compacting device relative to the shovel in the given direction.

4,311,105

SEWING MACHINE

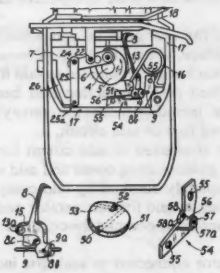
Riccardo Buzzi, Via 5 Maggio No. 19, Milano, Italy

Filed Jan. 17, 1979, Ser. No. 4,290

Claims priority, application Italy, Jan. 30, 1978, 19765 A/78; Dec. 22, 1978, 31215 A/78

Int. Cl.³ D05B *1/06*

U.S. Cl. 112—199 **6 Claims**



1. A sewing machine of the type for making chain stitches, comprising

a shrouding case,

a sewing needle,

a hook co-operating with said needle for making chain stitches,

a feed dog for feeding material to be sewn,

a driving motor,

a shaft rotated by said driving motor,

a cam on said shaft,

a supporting member for said hook,

said supporting member pivotally supporting said hook about a first axis and being pivotally connected to said shrouding case about a second axis forming an angle with said first axis,

means for limiting pivotal movement of said hook with respect to said supporting member about said first axis, and

resilient means for constantly pushing said hook against said cam: wherein said cam has a peripheral profile for first displacing said hook about said first axis and then displacing said hook together with said supporting member about said second axis and vice versa, whereby said hook performs oscillations in two planes forming an angle between each other.

5. A sew machine as claimed in claim 1, further comprising

a connecting rod having one end eccentrically connected to said cam,

a connecting lever having one end pivotally connected to another end of said connecting rod,

a supporting arm having one end adjustably secured to said shrouding case and another end pivotally connected to another end of said connecting lever,

an arm integral with said feed dog and pivotally connected to said connecting rod at a point thereof between said one and said another end thereof, and

support means for pivotally supporting said feed dog on said shrouding case.

4,311,106

SEWING MACHINE WITH UPPER AND LOWER WORKPIECE TRANSPORTERS

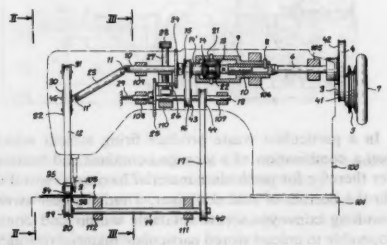
Franz Hanneman, Detmold, Fed. Rep. of Germany, assignor to Dürkoppwerke GmbH, Bielefeld, Fed. Rep. of Germany

Filed Oct. 31, 1979, Ser. No. 89,860

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1978, 2848123

Int. Cl.³ D05B *27/16*

U.S. Cl. 112—313 **5 Claims**



1. In a sewing machine having transport means for moving two stacked workpiece layers at relatively variable rates past a vertically reciprocating needle adapted to stitch them together,

the improvement wherein said transport means comprises an upper conveyor belt and a lower conveyor belt with parallel horizontal runs aligned to advance said layers between them, drive means for actuating said conveyor belts with codirectional displacement of said horizontal runs, and adjustable transmission means between said drive means and said conveyor belts for varying the relative rate of displacement of said horizontal runs.

4,311,107

WIND PROPELLED APPARATUS

Laszlo Imre, 750 Stierlin Rd. #136, Mountain View, Calif. 94043

Filed Oct. 16, 1979, Ser. No. 85,338

Int. Cl.³ B63H *9/08*; B63B *15/00*

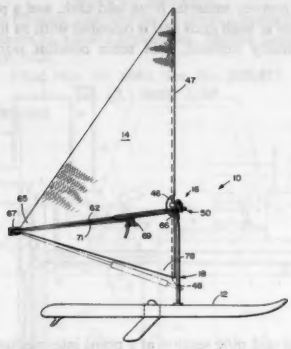
U.S. Cl. 114—39 **9 Claims**

1. In a wind-propelled apparatus (10) which comprises a body (12) supportable by water and adapted to support a user, a generally vertical mast (46) generally orthogonal to the body (12) and a sail (14) supported by the mast (46), an improvement comprising:

a stub mast (18) generally vertical and generally parallel to the mast (46);

means (20) for mounting a bottom portion (22) of the stub mast (18) to the body (12);

wherein a bottom end (48) of the mast (46) is spaced from and free of connection with the body (12); and



means (50) for mounting the mast (46) to the stub mast (18) and in rotating relation about a generally vertical line.

4,311,108

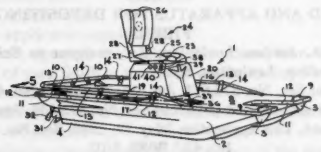
PROPELLED WATER CRAFT

Jerry L. Horton, 2925 Eugene St., Bossier City, La. 71112

Filed Feb. 16, 1979, Ser. No. 12,875

Int. Cl.³ B63B *1/00*

U.S. Cl. 114—61 13 Claims



1. A propelled water craft comprising:

(a) a pair of pontoons in generally parallel, spaced relationship;

(b) a deck connecting and covering said pontoons;

(c) seat means mounted on said deck;

(d) a first reversible electric motor carried by one of said pontoons, and a second reversible electric motor carried by the other of said pontoons, said first reversible electric motor and said second reversible electric motor mounted in fixed relationship on said pontoons, respectively, and the forward ends of said first reversible electric motor and said second reversible electric motor positioned at a preselected angle with respect to said pontoons, respectively;

(e) first thrust control means for said first reversible electric motor, and second thrust control means for said second reversible electric motor, mounted on said seat means and cooperating with said first reversible electric motor and said second reversible electric motor, respectively, whereby forward and reverse operation of said first reversible electric motor and said second reversible electric motor are facilitated; and

(f) a first motor start switch for said first reversible electric motor, and a second motor start switch for said second reversible electric motor, mounted on said deck and cooperating with said first reversible electric motor and said second reversible electric motor, respectively, whereby said first reversible electric motor and said second reversible electric motor are selectively energized to steer said water craft by operation of one or both of said first reversible electric motor and said second reversible electric motor.

4,311,109

FAIRLEAD

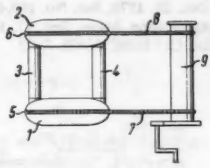
Michael G. Webb, Wootton Bridge, England, assignor to The British Petroleum Company Limited, London, England

Filed Feb. 19, 1980, Ser. No. 122,609

Claims priority, application United Kingdom, Mar. 6, 1979, 07833/79

Int. Cl.³ E02B *15/04*

U.S. Cl. 114—220 5 Claims



1. A rotatable fairlead comprising means for the deployment, control and recovery of an inflatable anti-pollution boom, including two end pieces, two pins mounted between said end pieces and spaced apart so that said boom may pass between the pins, means for rotating said end pieces and pins through at least 270° and means for holding said end pieces and pins at a given angle of rotation.

4,311,110

ELECTROSTATIC PHOTOCOPYING APPARATUS WITH IMPROVED DEVELOPER SUPPLY MEANS

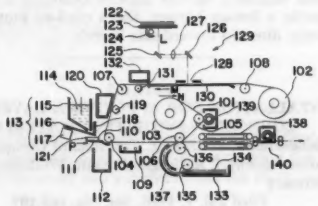
Kenichi Matsumura, Yamatokoriyama; Shinichi Mizuguchi, Katano; Tadayuki Onoda; Tsutomu Hamada, both of Neyagawa, and Hisato Noda, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 28, 1980, Ser. No. 136,071

Claims priority, application Japan, Mar. 30, 1979, 54-38756; Mar. 30, 1979, 54-38757

Int. Cl.³ G03G *15/08*

U.S. Cl. 118—50.1 4 Claims



1. An electrostatic photocopying apparatus comprising:

a photosensitive body having a photoconductive material thereon;

means for transporting said body along a path;

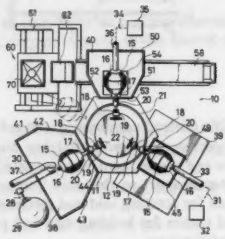
A supply device positioned along said path for uniformly covering said body with image forming particles which are to be subsequently exposed and then developed, said supply device having a multi-stylus electrode including a plurality of stylus-like electode elements supported in position with the tips of the respective electrode elements positioned adjacent the body and across the body in the width direction of the body, means for applying to said electrode a voltage of a polarity opposite to the polarity of the charge on said body for causing the image forming

particles to adhere to said body, means for supplying the image forming particles to the multi-stylus electrode; and a singlelayer producing means positioned along said path subsequent to the multi-stylus electrode in the direction of transportation of the body for removing from the body the image forming particles which do not directly contact the body thereby leaving only a single layer of particles.

4,311,111
APPARATUS FOR PAINTING A MULTIPLICITY OF PARTS TOGETHER

Toshimitsu Inaba, Kurobe, Japan, assignor to Kogyo K. K. Yoshida, Tokyo, Japan

Filed Dec. 20, 1979, Ser. No. 105,496
Claims priority, application Japan, Dec. 27, 1978, 53-164914
Int. Cl.³ B05C *11/02, 7/02*
U.S. Cl. 118—56 **13 Claims**



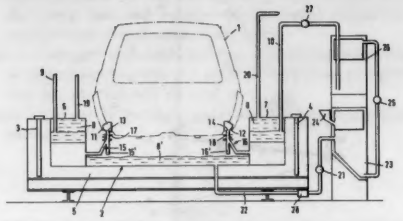
1. An apparatus for painting batches of parts, comprising:
(a) a frame having a stationary annular rail;
(b) a turntable rotatably mounted on said frame and concentrically surrounded by said annular rail;
(c) a plurality of angularly spaced barrels rotatably supported jointly by said rail and turntable and extending radially outwardly of said annular rail, each of said barrels being receptive of a batch of parts;
(d) first drive means on said frame for indexing said turntable to move said barrels successively to at least three separate angularly spaced stations disposed on said frame around said turntable;
(e) second drive means on said frame for rotating said barrels only in said angularly spaced stations; and
(f) said angularly spaced stations including a paint spray nozzle, a hot-air blower, and a cool-air blower, respectively, directed toward said barrels.

4,311,112
INSTALLATION FOR APPLYING A LAYER OF A CORROSION-INHIBITING MATERIAL

Kurt Siebeneichen, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jul. 1, 1980, Ser. No. 165,107
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1979, 2926949
Int. Cl.³ B05C *7/04*
U.S. Cl. 118—408 **3 Claims**

1. In apparatus for applying, by flood coating, a layer of a corrosion-inhibiting material to internal surface regions of cavities in a metal structure via passages communicating with the cavities, which apparatus includes at least one conduit having an outlet end arranged to communicate with one such passage for feeding corrosion-inhibiting material through that passage and into a cavity communicating therewith, the conduit extending substantially vertically in the region of its outlet end, a heated collecting trough positioned below the conduit for collecting material which drains out of the cavities, a heated storage tank connected to the conduit to supply material thereto, and a conveying device for conveying material from the tank into the conduit, the improvement wherein said conduit comprises, in the region of its outlet end, a main conduit portion extending upwardly at an angle to the vertical and arranged to convey material from said tank, and a pipe section which is open at both ends and is oriented with its longitudinal axis substantially vertical, said main conduit portion being

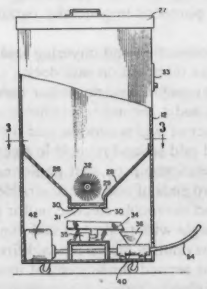


connected to said pipe section at a point intermediate the ends of said pipe section for conveying material in an upward direction into said pipe section, the upper end of said pipe section constituting the outlet end of said conduit, and the lower end of said pipe section constituting a drain opening via which excess corrosion-inhibiting material can flow from the associated cavity into said collecting trough.

4,311,113
METHOD AND APPARATUS FOR DEPOSITING FLOCK FIBERS

Richard A. Jordan, Lexington, Ky., assignor to Solar Suede Corporation, Lexington, Ky.

Division of Ser. No. 872,671, Jan. 26, 1978, Pat. No. 4,246,294, which is a continuation-in-part of Ser. No. 673,439, Apr. 5, 1976, abandoned. This application May 19, 1980, Ser. No. 150,741
Int. Cl.³ B05B *5/02*
U.S. Cl. 118—629 **5 Claims**



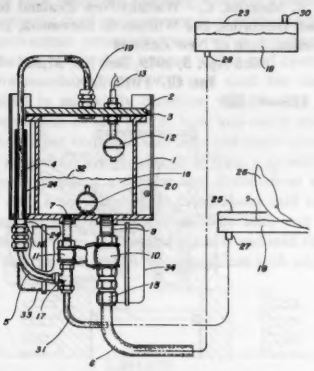
1. Apparatus for electrostatically depositing elongated fibers comprising means for feeding said fibers and means for generally aligning and delivering said fibers in a rotationally statilized flow, said aligning and delivery means including a venturi flow tube for receiving said fibers, a source of compressed air to said venturi flow tube to entrain said fibers, and an elongated non-rectilinear small diameter tube connected between said venturi flow tube and an electrostatic gun for delivering said fibers and maintaining their alignment in a parabolic air velocity distribution within the tube, said electrostatic gun including a nozzle and an electrode that is connected to a source of high voltage, said tube being connected with said gun nozzle.

4,311,114

LOW SHEAR GRAVITY CONTROLLED YARN FINISH SUPPLY SYSTEM

Robert Lees, Chester, and Marvin C. Jones, Chesterfield, both of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 10, 1980, Ser. No. 205,477
Int. Cl.³ B05C *1/08*
U.S. Cl. 118—694 **2 Claims**



1. A pumpless, nonrecirculating, low-shear, gravity controlled, yarn finish supply system for yarn finishes sensitive to fluid shear comprising

a distribution tank

a finish applicator

a finish applicator supply pan

a first tube opening vertically to the atmosphere above the level of yarn finish in the finish applicator supply pan and communicating with

a conduit between the distribution tank and the finish applicator supply pan

a second tube communicating with the top of the distribution tank and said second tube extending downward into said first tube and to an opening within the first tube just at the level of the yarn finish in the finish applicator supply pan, said opening being horizontal,

whereby the yarn finish is supplied to the supply pan with level controlled by intermittent admission of air to the top of the distribution tank through the second tube; as the level of yarn finish in the supply pan drops due to use by the finish applicator, the level in the first tube, which communicates with the supply pan, also drops uncovering the opening at the end of the second tube permitting flow of air, which flows through from the opening in the first tube and into the second tube into the distribution tank releasing an equal volume of yarn finish to flow through the conduit between the supply pan and the first tube, raising the level in both the pan and first tube until the opening in the second tube is covered and sealed, preventing further flow of air until the level drops again due to use by the finish applicator, repeating the controlled level yarn finish supplying process.

4,311,115

NOVEL AGGREGATE COMPOSITION AND METHOD FOR MAKING SAME

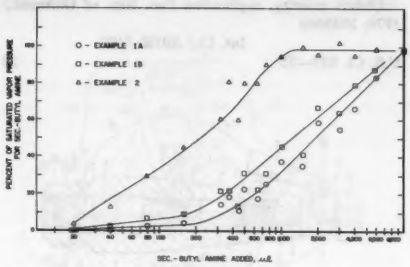
Paul C. Litzinger, Camas, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Sep. 15, 1980, Ser. No. 186,995
Int. Cl.³ A01K *1/015*
U.S. Cl. 119—1 **23 Claims**

1. A method for forming a compressed, aggregate composition having a high degree of liquid absorbency and a high level of odor adsorbency, respectively, which comprises

(a) forming an aqueous slurry including paper mill solid waste material and partially pyrolyzed cellulosic residue;

(b) compressing said aqueous slurry to produce a wet aggregate product; and



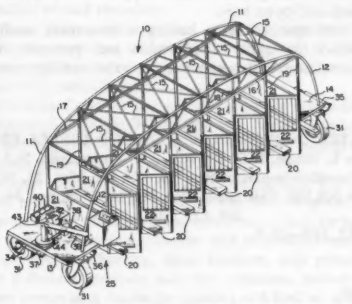
(c) drying the wet aggregate to produce said compressed aggregate composition.

4,311,116

IN-MOTION STARTING GATE

David A. Chamberlin, P.O. Box 1243, Reseda, Calif. 91335

Filed Jul. 28, 1980, Ser. No. 172,700
Int. Cl.³ A63K *3/02*
U.S. Cl. 119—15.5 A **12 Claims**



1. An in-motion starting gate adapted to be positioned across a race track and then moved in its entirety along the length dimension of the track and removed from the track, comprising:

a supporting frame structure for the gate;

a series of side-by-side stalls, each having respective forward and rear gates which are pivotally mounted to open and close, carried by the supporting frame structure;

wheels pivotally mounted at or near each end of the frame structure of the gate supporting and guiding the frame structure for the gate;

hydraulically driven motors drivingly engaging the wheels;

hydraulic steering means;

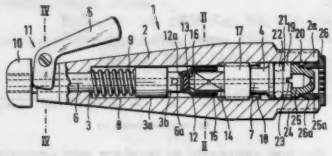
power means, mounted on the frame, operatively connected to and supplying hydraulic power to the motors and the steering means; and

control means operatively connected to the hydraulic motors for controlling the movement and the speed of the wheels and connected to the steering means for controlling the direction of the wheels.

4,311,117
ANIMAL DRINKING FOUNTAIN

Rainer von Taschitzki, Cologne, Fed. Rep. of Germany, assignor to Aratowerk Walter von Taschitzki, Fed. Rep. of Germany

Filed May 8, 1980, Ser. No. 147,790
Claims priority, application Fed. Rep. of Germany, May 9, 1979, 2918661
Int. Cl.³ A01K 7/00
U.S. Cl. 119—75 13 Claims

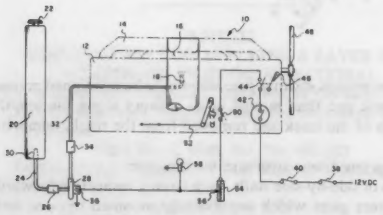


1. An animal drinking fountain comprising:
(a) an elongated tap housing having a bore with a liquid inlet opening and a spring loaded valve plunger means movably disposed between an open and a closed position within said housing,
(b) a valve operating means pivotally mounted on the tap housing to engage the valve plunger means,
(c) valve seating means disposed between said valve plunger means and the liquid inlet opening of said housing and having a bore opened toward said valve plunger,
(d) said valve seating means having a valve seat around said opened bore at the end thereof,
(e) sealing means disposed between the valve plunger means and including spacer means supported on the valve seat to seal said open bore,
(f) said spacer means having a structural configuration which is axially displaceable and prevents rotational movement with respect to the valve seating means.

4,311,118
WATER INJECTION SYSTEM FOR DIESEL ENGINE

Bernie L. Slagle, R.D. #6, Rte. 206, Vincentown, N.J. 08088

Continuation-in-part of Ser. No. 779,723, Mar. 21, 1977, Pat. No. 4,240,380. This application Jul. 10, 1979, Ser. No. 56,185
Int. Cl.³ F02D 19/00
U.S. Cl. 123—25 A 7 Claims

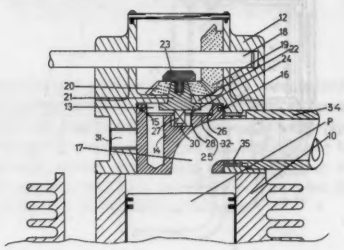


1. A water injection system in a diesel internal combustion engine including an air intake manifold comprising:
a reservoir for holding a supply of water;
an electric pump means and means connecting the same to said reservoir for providing pressurized water from said reservoir;
electric circuit means for providing electric power to said pump means; a light means in series with said pump means for indicating when said reservoir is empty;
means within said circuit means for manually adjusting the amount of power provided to said pump means to thereby adjust the pumping capacity thereof;
nozzle means located in said manifold and means connecting the output of said pump means to said nozzle means, and
switch means within said circuit means, said switch means being responsive to at least one predetermined proper operating condition of said engine for starting said pump means to thereby pump water to said manifold.

4,311,119
INTERNAL COMBUSTION ENGINES

Murray A. Menzies, C/- Waitaki New Zealand Refrigerating Limited, Balclutha, and William G. Stevenson, 2/153 Songer St., Nelson, both of New Zealand

Filed Apr. 5, 1979, Ser. No. 27,505
Int. Cl.³ F01L 7/00
U.S. Cl. 123—80 BB 7 Claims



1. In a rotary valve operated internal combustion engine having a cylinder with a piston located for reciprocal movement within the cylinder, a cavity having walls located at the end of the cylinder in which, in use of the engine, combustion takes place, a valve member mounted within said cavity, an hydraulic fluid receiving chamber defined by the end of the valve member which is axially remote from the cylinder and the walls of said cavity, a shaft extending through one of the walls of said cavity which is opposite to said end of said valve member, said shaft being mounted for rotary movement, an inlet port, a spark plug port and an exhaust port all opening into said cavity, a combustion spaced formed in the valve member, drive means coupling said shaft to a crankshaft of the engine to which the piston is coupled whereby the combustion space in said valve member can be successively indexed with said inlet, spark plug and exhaust ports, an hydraulic fluid reservoir and inlet and outlet means coupling said reservoir to said hydraulic fluid receiving chamber whereby a determined volume of hydraulic fluid can be maintained within said chamber, the improvement comprising said valve member being coupled to the end of the shaft located within said cavity by said end of said shaft within said cavity having an angular cross-section, an opening in said end of said valve member which is axially remote from said cylinder having an angular cross-section corresponding to that of said end of said shaft, said end of said shaft extending through said opening and having an enlarged portion to prevent it from being withdrawn from said opening so that said valve member rotates with said shaft but can slide along said shaft in an axial direction with respect to the reciprocal movement of said piston, a passageway extending through said shaft, a valve situated in said passageway operated by an operating member which is moved in response to axial movement of said valve member to close off ports which open into said passageway at the end which is in engagement with said valve member.

2. In a rotary valve operated internal combustion engine having a cylinder with a piston located for reciprocal movement within the cylinder, a cavity having walls located at the end of the cylinder in which, in use of the engine, combustion takes place, a valve member mounted within said cavity, an hydraulic fluid receiving chamber defined by the end of the valve member which is axially remote from the cylinder and the walls of said cavity, a shaft extending through one of the

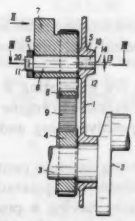
walls of said cavity which is opposite to said end of said valve member, said shaft being mounted for rotary movement, an inlet port, a spark plug port and an exhaust port all opening into said cavity, a combustion spaced formed in the valve member, drive means coupling said shaft to a crankshaft of the engine to which the piston is coupled whereby the combustion space in said valve member can be successively indexed with said inlet, spark plug and exhaust ports, an hydraulic fluid reservoir and inlet and outlet means coupling said reservoir to said hydraulic fluid receiving chamber whereby a determined volume of hydraulic fluid can be maintained within said chamber, the improvement comprising said valve member being coupled to the end of the shaft located within said cavity such that the valve member rotates with said shaft but can slide along said shaft in an axially direction with respect to the reciprocal movement of said piston, inlet and outlet ducts are inserted at their inner ends into said inlet and outlet ports, said inner end of each duct being reduced to form a shoulder, and sealing means comprising a tubular seal fitted about said reduced inner end, a secondary seal fitted about said reduced inner end and located behind said tubular seal, and spring means disposed between said secondary seal and said shoulder on said duct to urge said seals into engagement with said valve member.

4,311,120

COUNTERBALANCE FOR AN INTERNAL COMBUSTION ENGINE

Fritz Freyn, and Josef Greier, both of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Jul. 26, 1979, Ser. No. 60,990
Claims priority, application Austria, Aug. 29, 1978, 6277/78
Int. Cl.³ F02B 75/06
U.S. Cl. 123—192 B **4 Claims**



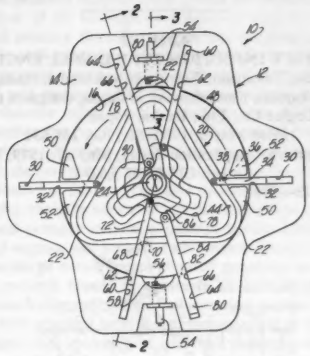
1. A counterbalance for an internal combustion engine having a housing and a crankshaft extending therefrom, comprising, a counterbalance weight, a non-slipping drive and transmission means acting between said crankshaft and said weight, said means including a driven part, said weight thereby being driven by said crankshaft via said means, a shaft mounted on said housing, said driven part of said means being combined with said weight, said combined weight and driven part being pivotally mounted on said shaft for rotation about the axis thereof by said crankshaft, one end of said shaft having a journal pin arranged eccentrically to said shaft axis and being pivotally mounted on said housing, the other end of said shaft having a journal pin arranged concentrically to said shaft axis, said shaft axis being displaceable relative to the crankshaft axis upon pivotal movement of said shaft about the axis of said eccentrically arranged journal pin for adjustably tensioning said non-slipping drive and transmission means upon said pivotal movement, and a bearing element affixed to said concentrically arranged pin and being displaceable relative to said housing to permit the displacement of said shaft during the tensioning of said transmission means.

4,311,121

ROTARY DEVICE

Larry L. Hartsell, 3100 Alco, Pontiac, Mich. 48055

Filed Sep. 24, 1979, Ser. No. 78,148
Int. Cl.³ F02B 53/00
U.S. Cl. 123—228 **5 Claims**



1. A rotary device comprising:

a housing having a wall defining an interior cylindrical chamber;

a rotary piston positioned within said chamber;

means for rotatably mounting said piston member to said housing coaxially with said chamber;

said piston member having at least one radially outwardly protruding lobe having a length substantially the same as the radius of said chamber;

at least one planar seal member, said seal member being slidably mounted in a slot in said housing, said slot being open to said chamber so that one edge of the seal member extends into said chamber;

means for slidably displacing said seal member in said slot in synchronism with the rotation of said piston member so that said edge of said seal member sealingly engages the outer circumference of said piston;

fluid passage means formed through said housing and open to said housing chamber adjacent said seal member;

wherein said fluid passage means comprises a fuel/air intake open at one end to said chamber and at its other end to a fuel/air source whereby, upon rotation, said piston inducts a fuel/air mixture into said chamber, said device further comprising means for igniting said fuel/air mixture at a selected rotational position of the piston to thereby rotatably drive said piston;

wherein said igniting means comprises an igniter and wherein said device further comprises a first planar valve member slidably disposed in a slot in said housing adjacent to and upstream from said igniter with respect to the rotation of said piston, a second planar valve member slidably disposed in a slot in said housing downstream from said igniter, said valve members forming a combustion chamber therebetween, and means for radially displacing said valve members in said slots in synchronism with the rotation of said piston whereby said first valve member is spaced apart from piston until said lobe is substantially aligned with said first valve member and whereby said second valve member becomes spaced apart from said piston when said lobe is substantially aligned with said second valve member;

wherein said means for displacing said valve members comprises a pair of cam slots formed on at least one axial end of said piston, a first elongated cam follower having one end secured to the first valve member and its other end positioned within one of said cam slots and a second elongated cam follower having one end connected to said

second valve member and its other end positioned within the other cam slot; and

wherein a first cam follower pin is secured to said other end of said first cam follower means, a second cam follower pin is secured to said other end of said second cam follower means and wherein one of said pins is longer but has a cross-sectional shape smaller than the other pin.

4,311,122

DIRECT INJECTION TYPE DIESEL ENGINE

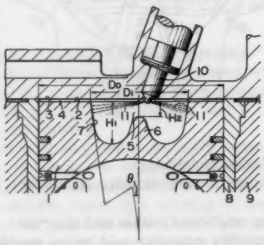
Tosio Banba, Takatsuki; Katsuyuki Morichika, Itami, and Tetsuya Nakanishi, Kawanishi, all of Japan, assignors to Yanmar Diesel Engine Co., Ltd., Osaka, Japan

Filed May 9, 1980, Ser. No. 148,534

Claims priority, application Japan, May 17, 1979, 54-61322

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—279 **1 Claim**



1. A direct injection type diesel engine including a piston having a toroidal combustion chamber, characterized in that said combustion chamber has a peripheral wall which extends downwardly from the top of said piston to a juncture between said peripheral wall and the bottom wall of said combustion chamber and is inclined uninterruptedly inwardly of said combustion chamber over the entire extent of said peripheral wall, the ratio of the diameter D_1 of the opening of said combustion chamber to the diameter D_0 of said piston is in the range between 0.45 and 0.6, the ratio of the diameter D_1 of the opening of said combustion chamber to the depth H_1 of said combustion chamber is in the range between 2.0 and 2.5, the ratio of the distance H_2 between the top of a toroid of said combustion chamber and the surface of the opening of said combustion chamber to the depth H_1 of said combustion chamber is in the range between 0.33 and 0.51, and the angle of inclination θ of the peripheral wall of said combustion chamber with respect to the axis of said piston is in the range between 5 and 20 degrees.

4,311,123

METHOD AND APPARATUS FOR CONTROLLING THE FUEL SUPPLY OF AN INTERNAL COMBUSTION ENGINE

Otto Glöckler, Renningen; Dieter Günther, Murr; Ulrich Steinbrenner, Stuttgart; Peter Schülzke, Hemmingen, and Albrecht Sieber, Böblingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 5, 1978, Ser. No. 966,704

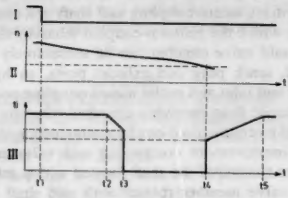
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1978, 2801790

Int. Cl.³ F02D *5/02*

U.S. Cl. 123—325 **19 Claims**

1. A method for controlling the fuel supply for an internal combustion engine during engine braking, comprising the steps of:

reducing the amount of fuel fed to the engine according to a first function of time at the onset of engine braking, wherein said first function of time decreases monotonically from an initial value equal to the quantity of fuel admitted at the onset of braking until the first function of time is approximately a predetermined percentage of the initial value whereupon the first function of time decreases abruptly to zero; and



increasing the amount of fuel fed to the engine according to a second function of time at the termination of engine braking, wherein said second function of time has an initial value which is a predetermined percentage of the nominal fuel quantity required by the engine for normal operation.

4,311,124

SIGNAL GENERATOR FOR SUPPRESSION OF FUEL SUPPLY ACTUATION AT TOP ENGINE SPEED

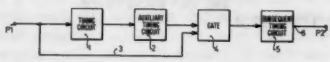
Peter Schülzke, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 12, 1978, Ser. No. 905,613

Claims priority, application Fed. Rep. of Germany, May 24, 1977, 2723371

Int. Cl.³ F02D *31/00*

U.S. Cl. 123—333 **7 Claims**



1. An apparatus for rpm-limitation in an internal combustion engine, said engine including fuel preparation and metering means, comprising:

ignition contact means for generating a train of electrical pulses which vary in response to engine rpm, each pulse in said train having a positive-going and a negative-going edge;

a first timing circuit having an input contact to receive the train of electrical pulses, for generating a first timing signal of finite duration having a positive-going and a negative-going edge, the onset of said first timing signal being determined by the arrival of a predetermined edge of each pulse in said train of electrical pulses;

an auxiliary timing circuit, connected to the first timing circuit, for receiving said first timing signal and for generating an auxiliary timing signal the onset of which is determined by the arrival of a predetermined edge of said first timing signal;

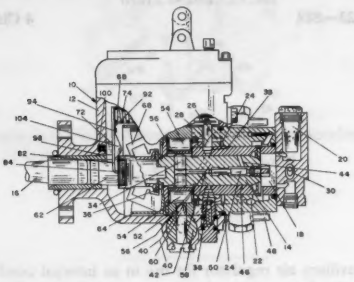
a gating circuit, connected to the auxiliary timing circuit, for receiving said auxiliary timing signal and having an input contact to receive said train of electrical pulses, said gating circuit generating a trigger signal in synchronism with said train of electrical pulses whenever said auxiliary timing signal is present and said predetermind edge of said pulse in said train of pulses is occurring at a preselected engine threshold rpm; and

a subsequent timing circuit, connected to the gating circuit, for receiving said trigger signal and for generating a control signal of finite duration in response to said trigger signal, said control signal being generated in synchronism with said trigger signal and serving to cut off fuel administration to the engine for the duration of said control signal.

4,311,125
FUEL INJECTION PUMP WITH UNIVERSAL GOVERNOR PLATE SUSPENSION SYSTEM

Arthur W. Smith, Glastonbury, Conn., and Marcus J. Gottsche, Hampden, Mass., assignors to Stanadyne, Inc., Windsor, Conn.

Filed Jan. 21, 1980, Ser. No. 113,526
Int. Cl.³ F02D *31/00*
U.S. Cl. 123—364 **6 Claims**

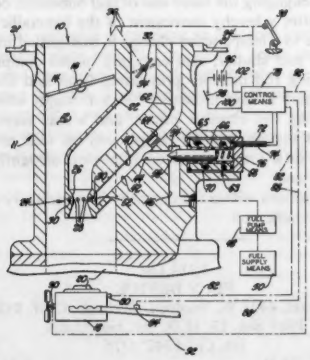


1. In a fuel injection pump for an internal combustion engine having a metering valve adjustable in opening and closing directions for variably metering the fuel delivered by the pump to the engine and an engine speed responsive governor including a pivotable governor plate for adjusting the metering valve by providing an increasing force with increasing speed to urge the metering valve in its closing direction and a fixed pivot for the governor plate, the improvement wherein said pivot has a spherical pivot surface and said governor plate is provided with an arcuate surface complimentary to and operatively cooperating with said spherical pivot surface to provide multi-directional pivotal movement of said governor plate.

4,311,126
FUEL INJECTION APPARATUS AND SYSTEM

Warren H. Cowles, Bloomfield Hills, Mich., assignor to Colt Industries Operating Corp, New York, N.Y.

Filed Jul. 23, 1979, Ser. No. 59,754
Int. Cl.³ F02B *33/00*
U.S. Cl. 123—438 **46 Claims**

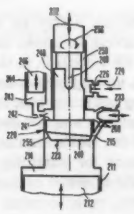


1. Fuel metering apparatus for supplying metered rates of fuel flow to a combustion engine, comprising body means, induction passage means formed through said body means for supplying motive fluid to said engine, said induction passage means comprising primary induction passage means and main induction passage means, said main induction passage means comprising first inlet means for permitting the inlet of air and first outlet means for discharging motive fluid to said engine, main throttle valve means for variably controlling the rate of flow of air into said first inlet means and through said main induction passage means, said primary induction passage means comprising second inlet means for permitting the inlet of air and second outlet means for discharging motive fluid to said engine, primary throttle valve means for variably controlling the flow of air through said primary induction passage means, said primary throttle valve means comprising a plate-like throttle valve member situated generally in said primary induction passage means, throttle shaft means extending transversely of said primary induction passage means and of said plate-like throttle valve member, said throttle shaft member being effective for variably positioning said throttle valve member within said primary induction passage means in accordance with the position of operator-controlled throttle linkage means indicative of the then operator demand on said engine so as to thereby variably selectively regulate the rate of air flow through said primary induction passage means during operation of said engine, said second outlet means comprising sonic venturi discharge nozzle means situated generally in said main induction passage means downstream of said main throttle valve means, fuel pump means, fuel metering means for metering liquid fuel supplied by said fuel pump means as to have all of said liquid fuel upstream of said fuel metering means and downstream of said fuel pump means at a superatmospheric pressure, said fuel metering means being effective for metering said liquid fuel under super-atmospheric pressure in response to engine demands and indicia of engine operation, and metered fuel conduit means communicating between said fuel metering means and said sonic venturi discharge nozzle means.

4,311,127
METHOD FOR OPERATING AN INTERNAL COMBUSTION ENGINE AND INTERNAL COMBUSTION ENGINE FOR CARRYING OUT THIS METHOD

Werner Mayer, Neckarhalde 11, 7148 Remseck, Fed. Rep. of Germany

Filed Jun. 18, 1979, Ser. No. 49,128
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1978, 2826807
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **12 Claims**



1. In a combustion engine, a combination comprising:
at least one cylinder, and a piston reciprocal in said cylinder;
a combustion chamber;
a fuel delivery system for said combustion chamber, including a piston compressor having a differential piston provided with a larger surface which in part bounds said combustion chamber and a smaller surface located in a compression chamber in which it compresses and thereby heats the gaseous fuel; and
means defining flow channels extending from said compression chamber to outlets in a wall surface bounding the path of movement of said differential piston, the latter having a control edge which exposes said outlets when said differential piston is in or near an upper dead center position thereof, said differential piston compressing gase-

ous fuel for heating said fuel to a temperature dependent on the amount of compression, said differential piston controlling thereafter the time at which the compressed fuel is admitted into said combustion chamber of the engine.

4,311,128

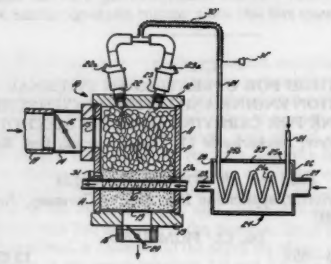
MEANS FOR SUPPLYING A FUEL/AIR MIXTURE TO AN INTERNAL COMBUSTION ENGINE

Gunther Bernecker, Montvale, N.J., assignor to Donald B. Conlin, Mahwah, N.J.

Continuation of Ser. No. 928,660, Jul. 28, 1978, abandoned, and a continuation-in-part of Ser. No. 872,707, Jan. 26, 1978, Pat. No. 4,103,658, which is a continuation-in-part of Ser. No. 806,798, Jun. 15, 1977, Pat. No. 4,089,314, which is a continuation-in-part of Ser. No. 770,964, Feb. 22, 1977, Pat. No. 4,086,893. This application Feb. 19, 1980, Ser. No. 122,625

Int. Cl.³ F02M *33/00*

U.S. Cl. 123—557 **5 Claims**



1. Means for supplying a fuel/air mixture to an internal combustion engine having an intake manifold and means for cooling the engine with a coolant, in the absence of a venturi, comprising a housing, means for injecting fuel into the housing, means for transferring sufficient heat from at least one of the exhaust gases of the engine and the coolant to the housing so that essentially all of the fuel is vaporized when it leaves the housing, conduit means for admitting air into the housing simultaneously with the injection of the fuel to form a mixture with the vaporized fuel, outlet conduit means communicating only with the housing and the intake manifold for conducting the entire mixture out of the housing directly to the intake manifold for combustion in the engine, rotor means positioned in said outlet means upstream of the valve means therein for rotation by the gases passing through the outlet conduit means, said rotor means being remote from the fuel injecting means, said heat transfer means including surfaces in the housing interposed between the fuel injecting means and said rotor means whereby the injected fuel is prevented from impinging directly on said rotor means and the injected fuel impinges upon said surfaces and vaporization thereof is essentially completed before the injected fuel reaches said rotor means, and respective valve means in the air admitting conduit means and in the outlet conduit means for controlling the flow of air through the air admitting conduit means and the flow of fuel-/air mixture through the outlet conduit means, respectively.

4,311,129

AUXILIARY AIR REGULATOR FOR INTERNAL COMBUSTION ENGINE

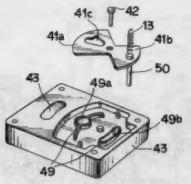
Tadao Kakizaki, Isezaki; Akira Utsugi, Fujimi; Masahiro Hibino, Tokyo, and Kizuku Otsubo, Kawasaki, all of Japan, assignors to Nissan Motor Co. Limited, Yokohama and Japan Electronic Control Systems Co. Ltd., Isezaki, both of, Japan

Filed Sep. 4, 1979, Ser. No. 72,435

Claims priority, application Japan, Oct. 23, 1978, 53-130303

Int. Cl.³ F02M *23/10*

U.S. Cl. 123—588 **4 Claims**



1. An auxiliary air regulator for use in an internal combustion engine having an air intake passage containing a throttle valve and provided with passages to the outside from points upstream and downstream of the throttle valve, comprising:

a mounting block within which is formed a bypass passage, one end of which is matingly connected with a passage in said air intake passage upstream of the throttle valve, and the other end of which is matingly connected with a passage in said air intake passage downstream of the throttle valve, said mounting block being directly attached to said air intake passage;

a shutter movably disposed within said bypass passage so as to control the effective cross-sectional area of said bypass passage, said shutter comprising a substantially flat plate having an aperture formed therein, said flat plate being pivotally connected to said mounting block;

a seat surrounding said bypass passage and formed by projections on said mounting block, in such a manner that said flat plate slides airtightly on said seat;

wall members defining a chamber airtightly separated from said bypass passage;

a bimetallic coil enclosed within said chamber and having its central end fixedly attached within said chamber;

means for engaging the outer end of said bimetallic coil with said shutter whereby movement of the bimetallic coil in response to a temperature change is transmitted mechanically to said shutter, said engaging means comprising a connecting rod member protruding from said shutter, a slot formed in said mounting block through which said connecting rod member passes, and a seat surrounding said slot and formed by projections on said mounting block in such a manner that said flat plate airtightly slides thereon; and

a heater disposed within the chamber for selectively heating said bimetallic coil.

4,311,130

FLUE DEVICE

Theodore Noose, 4401 W. Verdugo, Burbank, Calif. 91505

Filed Sep. 13, 1979, Ser. No. 75,334

Int. Cl.³ F24C *1/16*

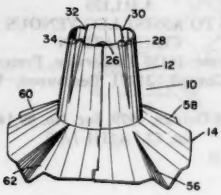
U.S. Cl. 126—25 B **14 Claims**

1. An improved portable flue device comprising, in combination:

a chimney;

a frusto-conical skirt extending downwardly and outwardly from said chimney, said skirt comprises flow channeling means for directing air flow radially inward from the edge to the central opening of said skirt, said flow channeling

means acting to limit the area, at the edge of the skirt, available to accommodate air flow to the chimney; and



means in the form of a venturi restriction for accelerating gas flow from skirt to chimney.

4,311,131

EVACUATED HEATPIPE SOLAR COLLECTOR

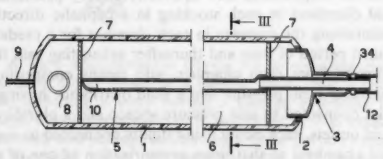
Faramarz M. Sabet, Via San Sebastiano, 33-Bergamo, Italy

Filed Dec. 14, 1978, Ser. No. 969,572

Claims priority, application Switzerland, Dec. 19, 1977, 15742/77

Int. Cl.³ F24J 3/02

U.S. Cl. 126—433 4 Claims



1. A solar collector comprising an absorber incorporated in an evacuated glass pipe for converting solar radiation into heat, a condenser connected with said absorber via a piping for transferring the heat, a transfer fluid in said piping and which when vaporized in said absorber is caused to condense in said condenser and transfers to said condenser vaporization heat of said transfer fluid, the arrangement being such that said condenser contains a heat-exchanger through which a working fluid is caused to flow to convey heat to utilization stations, said solar collector being characterized in that said absorber includes a tube which is transparent in the longitudinal direction and in which an absorbing plate is positioned, said plate being solidly connected with a channel containing said transfer fluid, said channel being closed at one end region and connected at the opposite region via a pipe and a sealing sleeve with said condenser heat exchanger, the condenser heat exchanger including a plurality of channels for collecting condensed transfer fluid, said condenser heat exchanger having an extended heat exchange surface resting against a corresponding surface of a heat exchanger device in good heat-transfer contact relationship, said working fluid flowing through said heat exchanger device, and spring elements constantly resiliently urging said condenser heat exchanger exchange surface against said corresponding surface of said heat exchange device.

4,311,132

SOLAR HEAT COLLECTOR

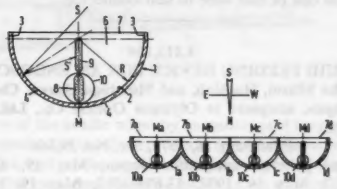
Josephus P. M. van Kuijk, Blonay, Switzerland, assignor to Patlico Rights N.V., Curacao, Netherlands Antilles

Filed Aug. 13, 1979, Ser. No. 65,852

Claims priority, application Netherlands, Aug. 21, 1978, 7808623

Int. Cl.³ F24J 3/02

U.S. Cl. 126—438 5 Claims



1. A solar heat collector comprising

a stationary elongated concave reflective surface having a semi-circular cross section bisected by a longitudinal median plane,

said reflective surface being permanently positioned with said median plane being in a vertical plane with a north-south orientation,

a cover plate of solar radiation transmissive material extending over said reflective surface,

two collector tubes extending side by side in said median plane between said reflective surface and said cover plate,

said collector tubes being thermally separated from each other and having cross-sectional shapes with elongated dimensions in said median plane;

said collector tubes occupying substantially all of said median plane between said reflective surface and a center axis defined by said reflective surface whereby said tubes receive substantially all of the sunlight incident upon said collector regardless of the time of day,

said elongated median plane dimension of the tube closer to said reflective surface being substantially less than said elongated median plane dimension of the tube closer to said cover plate, and

a solar radiation transmissive tube surrounding the collector tube closer to said reflective surface.

4,311,133

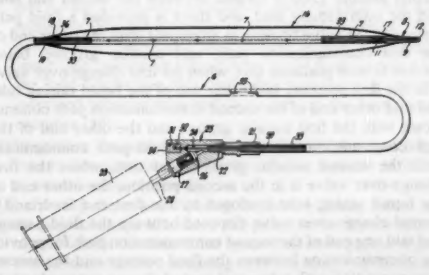
INTRA-AORTIC BALLOON

Thomas C. Robinson, Berkeley, Calif., assignor to Thoratec Laboratories Corporation, Berkeley, Calif.

Filed Mar. 10, 1980, Ser. No. 128,580

Int. Cl.³ A61B 19/00

U.S. Cl. 128—1 D 4 Claims



1. An intra-aortic balloon comprising a flexible catheter

having a proximal end and a distal end, means for closing said catheter at said distal end thereof, an elongated balloon having two ends, said balloon enclosing said catheter adjacent to said distal end with both of said balloon ends merging with said catheter, means establishing communication between the interior of said catheter and the surrounding interior of said balloon, a wire extending through said catheter substantially between said proximal end and said distal end thereof and movable endwise in said catheter, and a connector removably engaging the proximal end of said catheter for anchoring the proximal end of said wire to said connector.

4,311,134

FLUID FEEDING DEVICE FOR AN ENDOSCOPE

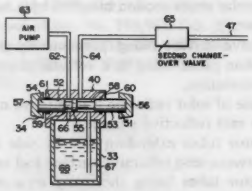
Kazuhiko Mitsui, Hachioji, and Mototugu Ogawa, Chofu, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 16, 1979, Ser. No. 39,366

Claims priority, application Japan, May 19, 1978, 53-67350[U]; May 19, 1978, 53-67351[U]; May 19, 1978, 53-67352[U]

Int. Cl.³ A61B *1/06, 1/12*

U.S. Cl. 128—6 **5 Claims**



1. In combination, an endoscope having a fluid passage extending through said endoscope and a fluid feeding device disposed externally of said endoscope, said fluid feeding device comprising an air pump; a sealed liquid reservoir; a first communication path communicating at one end with the air pump and at the other end with an upper portion of the liquid reservoir; a liquid raising tube having one end disposed in a lower portion of the reservoir and the other end opened; a second communication path having two ends, one end being connected to the fluid passage; a first change-over valve for connecting the other end of the liquid raising tube to the other end of the second communication path when the first change-over valve is set in a first position and for disconnecting the liquid raising tube from the second communication path and causing the first communication path to communicate with the second communication path when the first change-over valve is set in a second position; said first change-over valve being a spool valve including a valve housing having a bore and a spool reciprocatingly inserted into the bore and comprising a first end land, a second end land, an intermediate land disposed between both the end lands, a first annular groove formed between the first end land and the intermediate land and a second annular groove formed between the second end land and the intermediate land, and there is provided a fluid path formed in the valve housing in alignment with the other end of the first communication path, said annular grooves being formed in such positions that, when the first change-over valve is in the first position, said other end of the liquid raising tube and said other end of the second communication path communicate with the first annular groove and the other end of the first communication path and said fluid path communicate with the second annular groove, and that, when the first change-over valve is in the second position, the other end of the liquid raising tube is closed by the first end land; and a second change-over valve disposed between the fluid passage and said one end of the second communication path for providing communication between the fluid passage and the second communication path when said second change-over valve is in an open position and for effecting disconnection between the second communication path and the fluid passage when said second change-over valve is set in a closed position.

4,311,135

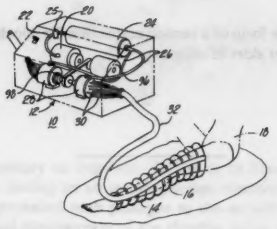
APPARATUS TO ASSIST LEG VENOUS AND SKIN CIRCULATION

Gerald G. Brueckner, 16135 Timberview, Fraser, Mich. 48026, and Edward Cantrell, 31251 Beechwood, Warren, Mich. 48093

Filed Oct. 29, 1979, Ser. No. 89,142

Int. Cl.³ A61H *1/00*

U.S. Cl. 128—24 R **12 Claims**



1. Apparatus to assist leg venous and skin circulation comprising:

a pair of stockings, one stocking being disposed around at least a portion of each leg of a person, said stockings each having a plurality of flexible members, each member defining an elongated and expandible fluid chamber, each fluid chamber extending substantially circumferentially around one of the person's leg, said chambers being axially adjacent each other;

means for sequentially and cyclically fluidly pressurizing said chambers in each stocking in a cephalic direction, maintaining the pressure in each chamber for a predetermined period of time and thereafter exhausting said fluid pressure from each chamber, said means comprising a source of fluid pressure and a fluid distributor having an inlet connected to said pressure source and a plurality of fluid outlets, each outlet being fluidly connected to one of said chambers so that upon pressurization of one of said chambers, the flexible member expands and compresses around the leg of the person; and

wherein said pressurizing means comprises means for providing a relatively lengthy rest period for each stocking following the sequential pressurization of all of the chambers in each stocking during each pressurization cycle; and

wherein said pressurizing means comprises means for offsetting the sequential pressurization of one stocking from the other stocking.

4,311,136

CATHETER CONNECTING HEAD WITH AT LEAST ONE DUCT IN A BASE MEMBER

Andreas Weikl, and Max Hubmann, both of Erlangen, Fed. Rep. of Germany, assignors to Intermedicat GmbH, Emmenbrucke, Switzerland

Filed Oct. 22, 1979, Ser. No. 86,799

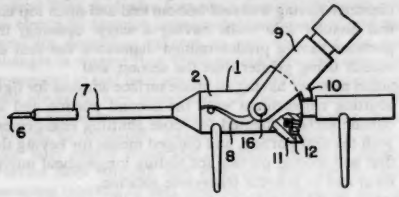
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1978, 2845643

Int. Cl.³ A61M *5/00*

U.S. Cl. 128—214.4 **19 Claims**

1. Catheter connecting head with at least one duct and a base member for the connection of an infusion system, a catheter, or the like, and for introduction of a puncture cannula, comprising means for preventing re-introduction of a puncture cannula into a puncture cannula insertion duct, said means including a

self-acting closure means for automatically closing the puncture cannula insertion duct upon withdrawal of the puncture



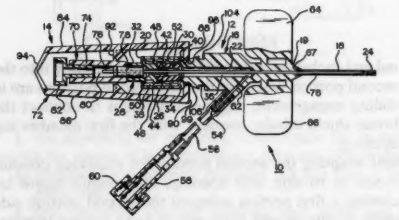
cannula from the puncture cannula insertion duct, and self-acting locking means for securing the closure means in a closing and locking position.

4,311,137

INFUSION DEVICE

William L. Gerard, Milwaukee, Wis., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Apr. 30, 1980, Ser. No. 126,806
Int. Cl.³ A61M *5/00, 25/00*
U.S. Cl. 128—214.4 **25 Claims**



1. A fluid administration device for introducing infusion liquid to a blood vessel of a patient comprising a catheter holder including a body having a passage extending therethrough, a catheter connected to said body in fluid communication with said passage and having a distal portion extending from the distal end of said body, movable seal means in the proximal end portion of said passage, a port connected with said passage at a point between said distal portion of said catheter and said seal means for introducing infusion liquid to said passage and catheter, and a needle extending in said passage and movable to an armed position in which said needle extends in said catheter and distally of the distal end of said catheter for inserting the distal ends of said needle and catheter into a patient, said needle being movable from said armed position and out of said catheter and body, said seal means normally being in a first position in said passage in which liquid can flow from said port and passage past said seal means to the atmosphere while said needle is in said passage to permit the purging of air from said body to a second position in which said passage is sealed from atmosphere at the proximal end portion thereof after said needle is removed from said body.

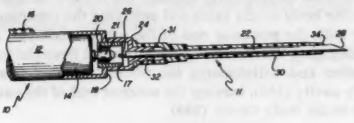
4,311,138

ILLUMINATED HYPODERMIC NEEDLE

Edward D. Sugarman, 6726 Gleason Pl., Fayetteville, N.Y. 13066

Filed Mar. 10, 1980, Ser. No. 128,826
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—214.4 **4 Claims**

1. A hypodermic needle assembly comprising in combination a portable light source, a hypodermic needle releasably connected at its proximal end to the light source, the needle being adapted to emit light at its distal end to facilitate venopuncture under subdued lighting conditions, the emitted light making it easier to locate and penetrate the vein, a bundle of light conducting optical fibers positioned in the interior of the needle and extending from adjacent the proximal to adjacent the distal end thereof, the bundle having a light receiving face at its proximal end for receiving light from the light source and having a light emitting face at its distal end for illuminating the distal end of the needle, the bundle occupying a portion only of



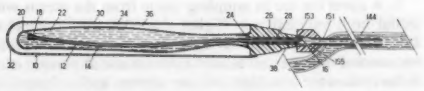
the interior of the needle whereby an unoccupied longitudinal passage remains for the flow of blood from the distal back to the proximal end of the needle after penetration of the vein, and a flexible catheter releasably mounted on the needle and extending from a point adjacent its proximal to a point adjacent its distal end, the catheter being adapted to enter the vein after the distal end of the needle has punctured same after which the needle can be withdrawn from the catheter.

4,311,139

METHOD AND APPARATUS FOR CATHETER INSERTION

Gordon E. Smith, Carrollton, Tex., assignor to Quest Medical, Inc., Carrollton, Tex.

Filed Mar. 28, 1980, Ser. No. 134,933
Int. Cl.³ A61M *5/00, 25/00*
U.S. Cl. 128—214.4 **4 Claims**



1. A method for inserting a flexible catheter (12) into a selected liquid-filled body cavity (144) comprising the steps of

(a) inserting the anterior end of a rigid, tubular member having a selected minimum internal diameter into the body cavity (144),

(b) deforming the external casing (34) of a containing chamber (22) having a wall (20) made of flexible, fluid-tight material having an outer surface and being enclosed within an elastically flexible external casing (34) having an inner surface, and having a completely enclosed fluid-filled space (36) defined by the inner surface of the external casing (34) and the outer surface of the wall (20), the containing chamber (22) containing a limp, flexible, substantially straight catheter (12) having an anterior end and a posterior end and a retaining ring (18) at the posterior end having a selected maximum diameter greater than the minimum internal diameter of the tubular member, the deformation decreasing the volume of the fluid-filled space (36), increasing the pressure of the fluid enclosed in the fluid-filled space (36), and subjecting the wall (20) to increased pressure substantially to exhaust the containing chamber (22),

(c) engaging the containing chamber (22) in fluid tight relation to the posterior end of the tubular member in fluid communication therewith,

(d) allowing the external casing (34) to elastically return to its original shape to relieve the pressure on the fluid enclosed within the fluid-filled space (36) and apply a negative pressure to the containing chamber (22), thus substantially filling the containing chamber (22) with liquid

drawn through the tubular member from the body cavity (144),

(e) deforming the external casing (34) to decrease the volume of the fluid-filled space (36) to increase the pressure of the air enclosed in the fluid-filled space (36) and apply positive pressure to the containing chamber (22), thus expelling the liquid with which the containing chamber (22) has been filled back into the body cavity (144) through the tubular member, drawing the anterior end of the flexible catheter (12) through the tubular member and into the body cavity (144) and engaging the retaining ring (18) with the posterior end of the tubular member, and

(f) disengaging the containing chamber (22) from the tubular member and withdrawing the tubular member from the body cavity (144), leaving the anterior end of the catheter (12) in the body cavity (144).

4,311,140

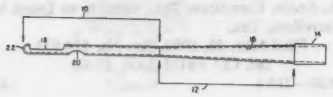
VACUUM CURET HAVING AN IMPROVED CURETTING OPENING

Henry Bridgman, P.O. Box 71, Convent Station, N.J. 07961

Continuation of Ser. No. 684,971, May 10, 1976, abandoned, which is a continuation-in-part of Ser. No. 381,740, Jul. 23, 1973, Pat. No. 3,955,579. This application Jun. 4, 1979, Ser. No. 45,403

Int. Cl.³ A61M *1/00*

U.S. Cl. 128—276 **14 Claims**



1. A curet for use in sampling tissue from the uterus with an initial high vacuum, e.g. higher than 0.2 atm., comprising a tube of flexible material having a distal end portion adapted to be inserted into the uterus, and a proximal end portion adapted to be connected to a high vacuum source, and an intermediate shank; said distal portion having at its tip region at least a pair of tip openings opposed to one another; one of said tip openings being rounded when viewed from a side plane parallel to the curet longitudinal axis, and the other being a macerator, said macerator opening being closer to the tip than the round one, and having an open cross section area of the lumen approximately 8 to 12 times the outside diameter of said curet in the distal portion; said macerator open cross section area further comprising three portions; a large central portion extending in a plane substantially parallel to and through the axis of the curet and having a length along the axis of approximately 10 to 12 mm, a cutting edge portion beginning at the distal end of said central portion and inclined slightly from a plane perpendicular to the axis of the curet toward the proximal end; and a rounded smooth portion beginning in said plane substantially through the axis of the curet and extending to the outer wall away from said plane in a half-round shape with a radius which is approximately one-and-one-half times the outside diameter of the curet, and said curet wall thickness in the region of said opening being approximately 0.025 inches to 0.04 inches.

4,311,141

BREAST PUMP

Arthur D. Diamond, 7511 Venetian St., #1, Miramar, Fla. 33023

Filed Mar. 13, 1980, Ser. No. 130,023

Int. Cl.³ A61M *1/06*

U.S. Cl. 128—281 **9 Claims**

1. A breast pump for manually extracting milk from a breast comprising:

a pump comprising;

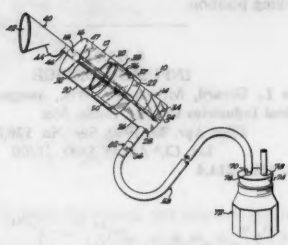
a first generally cylindrical portion having a first diameter including an open bottom end and a top end having an opening,

a second generally cylindrical portion having a second diameter having a closed bottom end and open top end and annular side walls having a single opening, the portions having predetermined diameters, the first diameter being greater than the second, and

a gasket member having an inside surface adapted for tight abutting engagement with the second portion and an outside surface adapted for loose abutting engagement with the first portion, and flanged means for keying the first and second portion for sliding longitudinal movement and to prevent transverse rotation,

a breast shield including a first funnel-like opening,

a middle portion and a lower second portion comprising a tubular downwardly extending member having a terminal end including a first valve means extending into the second portion when the first and second portions are in sliding engagement, engagement means to connect the breast shield tubular member with the first member top opening,



means adapting the second portion for receiving conduit means at its side wall opening, the conduit means including a first portion adjacent the second portion side walls having second valve means and a second terminal portion including an open end adapted for fitting to a receptacle,

the first valve means opening when the portions are pulled apart to form a partial vacuum and closing when the portions are pushed together, and

the second valve means closing when the portions are pulled apart and opening when the portions are pushed together.

4,311,142

DEVICE FOR DETECTING A LEAK OF LASER

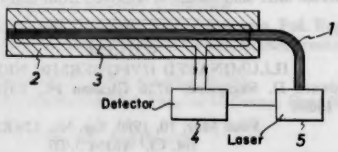
Haruhiko Machida, Tokyo, Japan, assignor to Machida Endoscope Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1978, Ser. No. 965,160

Claims priority, application Japan, Dec. 29, 1977, 52-176201[U]

Int. Cl.³ A61B *17/00*

U.S. Cl. 128—303.1 **7 Claims**



1. A laser guide suitable for insertion in a patient's body comprising an optical fiber formed of quartz glass and a plastic coating surrounding said optical fiber, a laser source optically coupled to one end of said optical fiber for supplying a laser

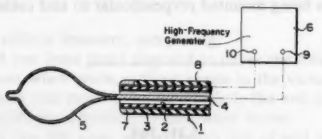
beam to be carried by said guide, an electrical wire located adjacent and along a substantial portion of the length of said optical fiber, said wire forming a current loop with two ends, an electrical detector connected to said ends of said electrical wire for supplying current to said wire and for detecting changes in current flow through said wire, said detector being connected to said laser source to control the operation thereof, said electrical wire comprising an electrical material affected by the impingement of a laser beam so as to alter the current flowing therethrough, means for terminating the operation of said laser source when said detector detects an alteration of current flow through said electrical wire due to laser light escaping laterally of said fiber and impinging on said wire.

4,311,143

APPARATUS FOR RESECTING TISSUE INSIDE THE BODY CAVITY UTILIZING HIGH-FREQUENCY CURRENTS

Osamu Komiya, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1979, Ser. No. 82,932
Claims priority, application Japan, Oct. 12, 1978, 53-125528
Int. Cl.³ A61B *17/39*
U.S. Cl. 128—303.15 **6 Claims**



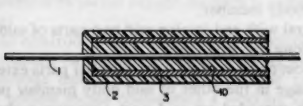
1. An apparatus for resecting tissue inside the human body cavity by means of high-frequency currents, comprising:
- an electrically insulating elongate tubular sheath having a distal end;
- a first electrode exposed adjacent said distal end of said sheath;
- a snare means capable of advance out of said sheath and retreat completely within said sheath and spaced from said sheath distal end inwardly of said sheath for bringing tissue to be resected which is grasped thereby into close contact with said first electrode; said snare means constituting a second electrode;
- a control wire extending through said sheath and capable of advance out of and retreat into said sheath and coupled to said snare means, whereby said snare means is moved out of and completely into said sheath; and
- a means for supplying high-frequency currents to said snare means and said first electrode through the interior of said sheath.

4,311,144

ELECTRICAL SURGICAL KNIFE DEVICE

Shinichi Harada, Tsurugashima, Japan, assignor to Kabushiki Kaisha Medos Kenkyusho, Tokyo, Japan

Filed Apr. 2, 1980, Ser. No. 136,611
Claims priority, application Japan, Apr. 13, 1979, 54-49067[U]
Int. Cl.³ A61B *17/39*
U.S. Cl. 128—303.15 **2 Claims**



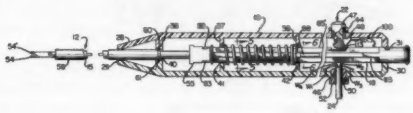
1. An electrical surgical knife adapted to be inserted into a body cavity of a patient through an endoscope comprising: a flexible insulating tube; a positive polarity electrode of said surgical knife disposed in said tube; a coaxial layer of insulating material disposed around said positive electrode; a metal sheath disposed inside said tube around portions of said positive polarity electrode disposed within said tube and insulated from said positive polarity electrode by said coaxial layer of insulating material, said positive polarity electrode being adapted to be connected to a high frequency electrical source; and a metal plate electrode adapted to be disposed in contact with the skin of a patient, said metal sheath electrically connected to said metal plate.

4,311,145

DISPOSABLE ELECTROSURGICAL INSTRUMENT

Janet M. Esty, Boulder, and John A. Cox, Broomfield, both of Colo., assignors to Neomed, Inc., Boulder, Colo.

Filed Jul. 16, 1979, Ser. No. 57,603
Int. Cl.³ A61B *17/39*
U.S. Cl. 128—303.17 **23 Claims**



1. In an electrosurgical apparatus wherein an electrode assembly is slidably mounted in a holder, the assembly having at least one electrode element projecting forwardly from one end of said holder to terminate in an element tip end which is operative to discharge electrical current applied thereto and further having a plunger at the end of said electrode element opposite to said tip end disposed within said holder for selective slidable advancement of said electrode element between an extended and retracted position, there being control circuit means disposed in said holder for selectively applying electrical operating current to said electrode element, the improvement comprising:

first and second connector members between one end of said plunger and said opposite end of said electrode element detachably interconnecting said electrode element and said plunger in axially aligned, end-to-end relation to one another;

said control circuit means including a first electrical lead projecting from said one end of said plunger and said electrode element including a second electrical lead projecting from said opposite end of said electrode element and movable into direct electrical contact with said first electrical lead when said first and second connector members are detachably connected together;

an outer electrically insulated sleeve disposed in surrounding relation to said electrode element along its substantial length, said sleeve having one end terminating adjacent to said electrode element tip end and an opposite end terminating adjacent to said opposite end of said electrode element; and

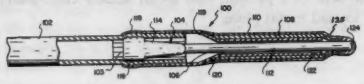
said holder including positioning means therein engageable with said opposite end of said sleeve whereby to anchor said sleeve with respect to said holder while supporting said electrode element in axially aligned relation to said plunger, and resilient means normally urging said electrode element into the retracted position with respect to said sleeve.

4,311,146

DETACHABLE BALLOON CATHETER APPARATUS AND METHOD

Terry M. Wonder, Salt Lake City, Utah, assignor to Sorenson Research Co., Inc., Salt Lake City, Utah

Filed May 8, 1980, Ser. No. 147,814
Int. Cl.³ A61M *25/00*
U.S. Cl. 128—325 22 Claims



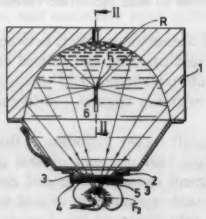
1. A detachable balloon catheter apparatus comprising:
an introducer catheter, said introducer catheter having an attachment means at the trailing end thereof for connection to a source of pressurized fluid;
an inflatable balloon positioned at the leading end of said introducer catheter, said balloon having an opening in fluid communication with the leading end of said catheter; and
valve means for automatically plugging the opening of said balloon after it is inflated by said pressurized fluid, said valve means comprising an elongated stem that is attached to the interior surface of said balloon.

4,311,147

APPARATUS FOR CONTACT-FREE DISINTEGRATION OF KIDNEY STONES OR OTHER CALCULI

Eberhard Häusler, Saarbrücken, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Knittlengen, Fed. Rep. of Germany

Filed May 8, 1980, Ser. No. 147,955
Claims priority, application Fed. Rep. of Germany, May 26, 1979, 2921444; May 26, 1979, 7915289
Int. Cl.³ A61B *17/22*
U.S. Cl. 128—328 3 Claims



1. In apparatus for contact-free shock wave disintegration of kidney stones or other calculi by generating electrical discharges across an underwater spark gap in the focus line of an elliptical reflector having two foci, namely, a first and second focus, and into whose second focus the calculus which is to be disintegrated is to be located, the improvement which consists in that plural electrode elements are positioned at intervals along the first focus of said reflector, said electrode elements being supported on an insulating carrier equipped with high tension connectors at the extremities, said connectors being electrically associated with the electrode elements, and said electrode elements being so spaced from one another as to form consecutive individual spark gaps.

4,311,148

MICRO-JEJUNOSTOMY FEEDING TUBE

Barry G. Courtney, Chicago, and Mitchell V. Kaminski, Jr., Niles, both of Ill., assignors to Mitchell V. Kaminski, Jr., Chicago, Ill.

Filed May 19, 1980, Ser. No. 151,143
Int. Cl.³ A61M *25/00*
U.S. Cl. 128—348 9 Claims

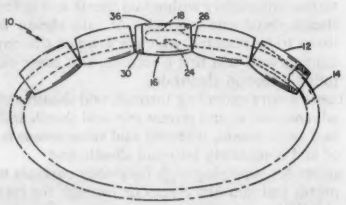
1. An elongated flexible feeding tube having a feed end and a discharge end for use in supplying nutrition or medication directly to the intestine comprising an elongated flexible catheter, a fabric cuff for subcutaneous implantation located on said catheter a distance from the feed end, a proximal wing of resilient material located on said catheter a distance from said fabric cuff toward the discharge end of said catheter equal to or greater than the thickness of the abdominal wall, a distal wing of resilient material located on said catheter a distance from said proximal wing toward said discharge end, both of said wings being mounted perpendicular to said catheter.

4,311,149

BEADED TEETHING RING, CLOSURE LATCH

Richard L. Panicci, Hanover, Mass., assignor to Kiddie Products, Inc., Avon, Mass.

Division of Ser. No. 858,537, Dec. 8, 1977, Pat. No. 4,233,714.
This application Jan. 7, 1980, Ser. No. 110,120
Int. Cl.³ A61J *17/00*; A44C *25/00*
U.S. Cl. 128—359 5 Claims



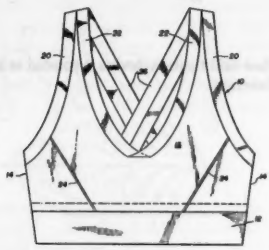
1. A string of beads comprising:
a thin hoop-shaped string of molded, self-supporting, organic thermoplastic material;
a plurality of beads on said string;
a latch member having a latching surface forming a latch shoulder, integrally formed on one end of said string;
a body member integrally formed on the other end of said string comprising two parts joined together and encapsulating said latch member therebetween in a recess formed between said parts, said recess having a shoulder engaging said latch shoulder to resist removal of said latch member from said body member;
a hinge integral with and joining said two parts of said body member along one side thereof; and
at least one post on one of said body member parts extending into a passage in the other of said body member parts, a head being provided on said post engaging a shoulder formed in said passage to resist disengagement thereof, said post and passage spaced from said recess on the side thereof opposite said hinge.

4,311,150

ATHLETIC BRASSIERE

Hinda S. Schreiber; Eugenie Z. Lindahl, both of Burlington, Vt., and Polly P. Smith, New York, N.Y., assignors to Jogbra Incorporated, Burlington, Vt.

Continuation of Ser. No. 965,381, Dec. 1, 1978, Pat. No. 4,174,717. This application Nov. 13, 1979, Ser. No. 94,318
The portion of the term of this patent subsequent to Nov. 20, 1996, has been disclaimed.
Int. Cl.[3] A41C *3/00*
U.S. Cl. 128—494 11 Claims



1. An athletic brassiere, comprising:

at least one front panel disposed to cover the front of both breasts when worn, without seams in the vicinity of the nipples, said panel being substantially flat and not shaped to uplift the individual breasts when worn;

at least one side panel sewn to each side of said panel such that the stitches of the seams are on the exterior surface of the panel facing away from the wearer when worn;

a wide elastic rib band connected to the bottom of said front and side panels and extending continuously around the body when worn, the front portion of said band being on the front of the wearer when worn and the back portion being on the back of the wearer when worn;

two elastic straps, one of said straps being connected at one end thereof to said front panel on the right side of the wearer when worn and connected at the other end thereof to the back portion of the said rib band on the left side of the wearer when worn, and the other of said straps being connected at one end thereof to said left front panel on the left side of the wearer when worn and connected at the other end thereof to the back portion of said rib band on the right side of the wearer when worn such that said straps cross in the back when worn; and

a skirt of fabric depending from said rib band to cover the midriff of the wearer when worn.

4,311,151

OXYGEN MEASURING ELECTRODE ASSEMBLY

Bunji Hagihara, 8-17, Fujishirodai 2-chome, Suita, 565, Japan

Continuation-in-part of Ser. No. 932,217, Aug. 9, 1978, abandoned. This application Oct. 16, 1979, Ser. No. 85,397
Claims priority, application Japan, Aug. 24, 1977, 52-101235; Oct. 22, 1977, 52-126988
Int. Cl.[3] A61B *5/00*
U.S. Cl. 128—635 12 Claims

1. A polarographic electrode assembly for transcutaneous measurement of partial oxygen pressure in arterial blood, comprising:

(a) an electrode part, including as an electrode unit:

an anode having a ring-shaped working surface;

cathode means constituting a cathode having working surface means constituting a working surface disposed within an imaginary circumscribing circle and perimetrically surrounded by said ring-shaped working surface of said anode, with radial spacing between said anode working surface and said cathode working surface means; and

an electrode holder of insulative material, said electrode holder holding said anode and said cathode means, maintaining said radial spacing, and providing an electrically and thermally insulated relationship for said anode and said cathode means relative to one another;

(b) a membrane holder part, including:

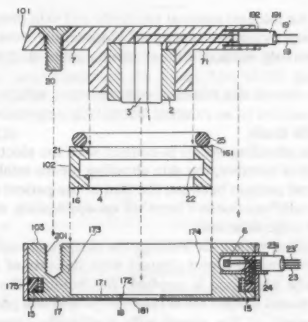
an oxygen-permeable hydrophobic electrode membrane having an outer peripheral margin; and

a cylindrical tubular membrane holder having an axially inner annular end face and an axially outer annular end face with a longitudinal bore extending between them;

means fixedly circumferentially holding said outer peripheral margin of said electrode membrane on said axially inner end face of said cylindrical tubular membrane holder with a predetermined, circumferentially substantially uniform tension and with said electrode membrane extending across said longitudinal bore; and

(c) a skin heating part, including:

an integral, heating conducting metal block having a radially inner relatively thin disk-shaped portion and a radially outer, relatively thick annular peripheral portion, each of these portions having an axially outer side and an axially inner side, the two axially inner sides being substantially axially aligned so as to provide one substantially flat surface incorporating both of them,



but the axially outer side of said relatively thin disk-shaped portion lying substantially axially inwardly of said axially outer side of said relatively thick annular peripheral portion, so as to provide an electrolyte well having said axially outer side of said relatively thin disk-shaped portion as its bottom and a radially inwardly facing generally cylindrical surface of said relatively thick annular peripheral portion as its sidewall;

means providing a generally central hole axially through said relatively thin disk-shaped portion of said integral, heat conducting block, said through hole communicating with said well and being of a size and shape large enough to expose therethrough substantially all of said working surface means of said cathode means when said electrode unit is telescopically axially received in said well;

said substantially flat surface being adapted to be presented in confronting relation to the skin of a subject who is to be monitored, said substantially flat surface being larger in area than said through hole; and

an electric heater and a temperature-detecting element, both being mounted on said skin heating part so as to form a unitary subassembly therewith;

said electrode unit being axially telescopically removably received in the bore of said membrane holder part and both said electrode unit and said membrane holder part being axially telescopically removably received in said well of said skin heating part, with both said anode

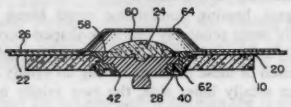
working surface and said cathode working surface means closely confronting said electrode membrane; said electrode membrane extending across said through hole to provide a portion thereof axially exposed through said through hole and having said cathode working surface means in operable relationship therewith.

4,311,152

MEDICAL ELECTRODE AND SYSTEM FOR MINIMIZING MOTION ARTIFACTS

Vernon E. Modes, Kent; Hak W. Tam, Kirkland; Wayne E. Quinton, Seattle; Alan G. Bailey, Everett; Robert A. Niskanen; Lou Vitez, both of Seattle, and Gary A. DeBardi, Redmond, all of Wash., assignors to Quinton Instrument Co., Seattle, Wash.

Filed Jan. 15, 1979, Ser. No. 3,109
Int. Cl.³ A61B 5/04
U.S. Cl. 128—641 **20 Claims**



1. An integral medical electrode and skin preparation device for improving the quality of biopotential event detection by minimizing motion artifact arising from skin potential, comprising:

an electrically conductive member to which electrical connection to an external electrically responsive recorder can be made;

skin abrading means in contact with the electrically conductive member, the skin abrading means establishing electrical contact between the skin of the patient and the electrically conductive member on application of the electrode to the skin; and

holding means for holding the electrically conductive member out of direct contact with the skin of a patient when the electrode is applied, for holding the skin abrading means against the skin of the patient and preventing movement of the electrically conductive member and skin abrading means relative to the skin of the patient except on application of a sufficient amount of force to the electrically conductive member after application of the electrode to the skin to cause the skin abrading means to move relative to the skin sufficiently to penetrate the epidermal layer thereof.

4,311,153

SCREW-IN LEAD HAVING LEAD TIP WITH MEMBRANE

Karel F. A. A. Smits, Oirsbeek, Netherlands, assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Sep. 30, 1980, Ser. No. 192,265
Int. Cl.³ A61N 1/04
U.S. Cl. 128—785 **8 Claims**

1. An implantable lead comprising:

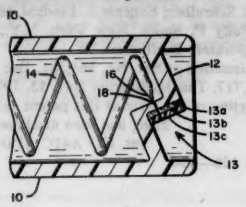
a conductor having a proximal end and a distal end;

an insulator having a proximal end and a distal end;

a chamber attached to said distal end of said insulator having an aperture;

a fixation device rotatably attached to said chamber whereby rotation of said fixation device is a first direction causes said fixation device to move proximal relative to said aperture and rotation of said fixation device in a second direction causes said fixation device to move distal relative to said aperture; and

a seal attached to said chamber at said aperture having a shape causing a portion of said fixation device to frictionally engage said seal in a direction substantially normal to the direction of motion of said portion of said fixation



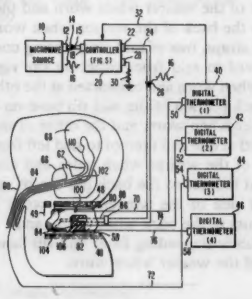
device when said fixation device is rotated in said first and second direction.

4,311,154

NONSYMMETRICAL BULB APPLICATOR FOR HYPERTHERMIC TREATMENT OF THE BODY

Fred Sterzer, Princeton, and Robert W. Paglione, Robbinsville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 23, 1979, Ser. No. 23,393
Int. Cl.³ A61N 1/40
U.S. Cl. 128—804 **7 Claims**



1. Apparatus for the hyperthermic treatment of selected living tissue internal to a body with microwave energy comprising:

a. source means for providing microwave signals having a predetermined amplitude and frequency; and

b. means for preferentially heating said selected tissue by applying said microwave signals to said selected tissue and living tissue adjacent to said selected tissue;

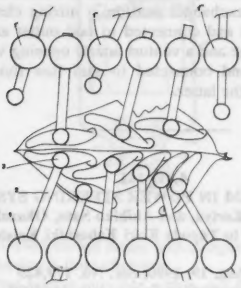
said preferential heating means for use within a passageway of said body and including a radiating probe coupled to said source means of microwave signals and a nonsymmetrical dielectric bulb, said bulb being configured and affixed to said probe to provide an electric field of said microwave signals from said probe that is more intense towards said selected tissue than towards said adjacent tissue when said bulb is properly positioned within said passageway of said body relative to said selected tissue.

4,311,155

PROCESS AND DEVICE FOR CUTTING OUT CIGAR WRAPPERS FROM A TOBACCO LEAF

Jean-Louis Dameret; Jacques Maximilien, and Jacques Paret, all of Fleury-les-Aubrais, France, assignors to Service d'Exploitation Industrielle des Tabacs et des Allumettes, Paris, France

Filed Aug. 14, 1979, Ser. No. 66,391
Claims priority, application France, Aug. 18, 1978, 78 24112
Int. Cl.³ A24B 7/14
U.S. Cl. 131—280 5 Claims



1. A process for simultaneously cutting a plurality of wrappers from a leaf or half-leaf of tobacco, said process comprising:

(a) determining the profile of each of said plurality of wrappers to be cut from said leaf or half-leaf;

(b) allocating a cutting tool to each of said wrappers to be cut;

(c) individually positioning each of said cutting tools at a starting point above a respective wrapper profile; and

(d) simultaneously displacing said cutting tools along identical paths, whereby a plurality of wrappers will be cut at the same time.

4,311,156

METHOD FOR AROMATIZING TOBACCO SMOKE

Jaques Bonnet, Lausanne, and Jean-Pierre Lebet, Montreux, both of Switzerland, assignors to Baumgartner Papier S.A., Switzerland

Filed Jun. 16, 1980, Ser. No. 159,623
Claims priority, application Switzerland, Jun. 14, 1979, 5551/79
Int. Cl.³ A24D 3/00, 3/14
U.S. Cl. 131—274 6 Claims

1. A method for aromatising tobacco smoke drawn through a cigarette, mouthpiece characterised by using a porous magnesium silicate and/or magnesium silicate hydrate charged with aromatic substances selected from the group consisting of menthol and synthetic or natural tobacco extracts in the cigarette mouthpiece.

4,311,157

SONIC TREATING APPARATUS

Duncan B. Jubenville, Windsor, Canada, and Melvin G. DeGrazia, Jr., Farmington Hills, Mich., assignors to Rock Oil Corporation, Detroit, Mich.

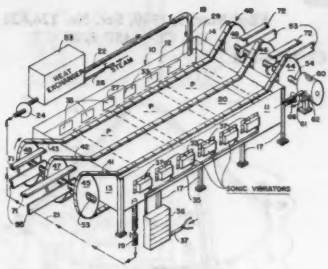
Filed Feb. 26, 1980, Ser. No. 124,812
Int. Cl.³ B08B 3/12
U.S. Cl. 134—125 18 Claims

1. A sonic treating apparatus for sheet material comprising:

(A) a shallow tank of treating liquid having parallel sidewalls,

(B) a plurality of sonic vibrators mounted on and outside said parallel sidewalls to produce a horizontally vibrating liquid in said tank, and

(C) a plastic sprocket chain conveyor resistant to said treating liquid for moving and supporting continuously the



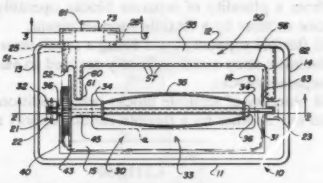
sheet material to be treated in said tank horizontally through and transversely to said horizontally vibrating liquid in said tank between said sonic vibrators, with opposite edges of said sheet being adjacent said parallel sidewalls and said vibrators.

4,311,158

WASHER-DRYER FOR PAINT ROLLERS

Jerry J. Harvey, 4403 Louisiana, St. Louis, Mo. 63111

Filed Mar. 6, 1980, Ser. No. 127,555
Int. Cl.³ B08B 3/02
U.S. Cl. 134—138 2 Claims



1. A device for cleaning hollow tubular paint rollers of a fixed length, comprising:

an enclosure,

a paint-roller rotatable spindle-shaft assembly mounted within the enclosure and having paint roller support means on its radially outer portion,

the axial extent of said paint roller support means being less than the fixed length of such a roller,

whereby the ends of such a roller mounted thereon are left open, together with

first water spray head means, positioned radially outward of the spindle-shaft assembly, whereby to wash such roller outer surface, and

second water spray head means, positioned axially outward of both ends of the spindle and directed substantially parallel to the axis of the spindle, whereby to spray water into the ends of such roller, further comprising

a water turbine adjacent to one end of said paint roller support means,

means coupling the water turbine to said paint roller support means,

jet nozzle means to direct a stream of water on the turbine, and

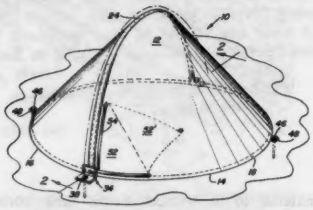
diverter valve means for supplying water selectively to both said first and second water spray head means or to only said jet nozzle means,

whereby operation of said diverter valve means may first wash such paint roller and then spin dry it.

4,311,159
PORTABLE TENT SHELTER

Frederick J. Wunderlich, 1599 Meisner Rd., Marine City, Mich. 48039

Filed Mar. 3, 1980, Ser. No. 126,821
Int. Cl.³ A45F 1/00
U.S. Cl. 135—1 R 10 Claims



1. A tent shelter capable of being quickly and easily erected and collapsed, said shelter comprising:

a fabric body for erection as a tent shelter having a ground contacting edge;

at least one flexible support member operably attached to said ground contacting edge of said fabric body so as to facilitate an erection of said tent shelter; and

at least one further flexible support member operably attached to said fabric body and serving to support said tent shelter in an erected manner above a ground surface,

said at least one flexible support member and said at least one further flexible support member each being formed in part from a plurality of separate blocks operably attached to one another by a flexible support means,

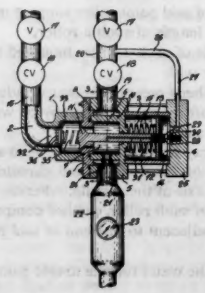
said flexible support means being a continuous substantially inelastic strap member fixedly secured to said plurality of separate blocks,

said plurality of separate blocks being additionally attached to one another by a flexible elastic support means.

4,311,160
FLUID MIXING VALVE

Leo Charland, 9620 Blvd. Gouin West, Pierrefonds, Prov. of Quebec, Canada (H8Y 1R5)

Filed Sep. 16, 1980, Ser. No. 187,947
Int. Cl.³ F16K 19/00
U.S. Cl. 137—111 6 Claims

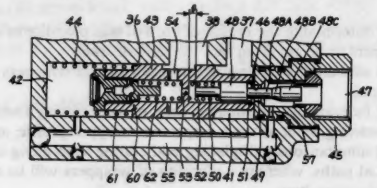


1. A fluid mixing valve comprising a body defining a first inlet for a first warmer fluid, a second inlet for a second colder fluid, an outlet for a mixer fluid, and a piston chamber; a valve serially positioned intermediate said first inlet and the mixed fluid outlet and biased toward closing of said first inlet; a piston in said piston chamber operatively displaceable with said valve and acting thereon for opening thereof; a passage means for the second fluid operatively communicating said second inlet with the piston chamber whereby upon unsufficient pressure of the second fluid, the piston and the valve will be allowed to move until closure of the valve and interruption of the flow of the first fluid outward through the mixed fluid outlet; first and second adjacent fluid passages forming a heat exchanger portion, said first fluid passage connected to said first inlet downstream of said valve and the second fluid passage connected to said second inlet whereby said first fluid pre-heats said second fluid in said heat exchanger portion; a mixing chamber disposed intermediate and connected to said outlet and to said second fluid passage and a venturi nozzle opening within said mixing chamber and connected to said first fluid passage downstream from the latter.

4,311,161
VALVE SYSTEM IN POWER STEERING SYSTEMS

Tadataka Narumi, Kariya, and Akihiko Sato, Okazaki, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 19, 1980, Ser. No. 179,429
Claims priority, application Japan, Aug. 31, 1979, 54-112225
Int. Cl.³ F04B 49/08
U.S. Cl. 137—117 4 Claims



1. A valve system in a power steering system comprising:

a pump body having a valve bore, an inlet port, a by-pass port and an outlet port;

a spool valve slidably carried in said bore and being movable in response to a pressure differential between said inlet port and said outlet port so as to by-pass an excess flow from said inlet port to said by-pass port;

a recess formed in said spool valve;

an orifice located in one end of said pump body through which a working liquid is communicated from said inlet port to said outlet port;

a control rod slidably carried in said recess and having a metering portion at one end thereof which extends through said orifice so as to form a variable orifice in cooperation with said orifice;

said metering portion being formed with a small diameter portion normally located at said orifice, a large diameter portion normally located in said outlet port and a tapered portion connected therebetween, said large diameter portion being so formed as to reduce the volume of said working liquid passing through said orifice when said control rod is moved inwardly of said recess;

a spring inserted in said recess for urging said control rod in a direction towards said orifice;

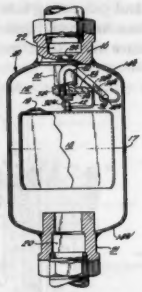
said control rod being movable relative to said spool valve so as to maintain the relative position of said control rod to said orifice during the movement of said spool valve when a working pressure in the power steering system exceeds a predetermined value.

4,311,162

INVERTED BUCKET STEAM TRAP

Ricky K. Wang, Blue Bell, Pa., assignor to Yarway Corporation, Blue Bell, Pa.

Filed Jun. 23, 1980, Ser. No. 162,177
Int. Cl.³ F16T 1/26
U.S. Cl. 137—185 19 Claims



1. An inverted bucket steam trap comprising:
a body having a float chamber;
an inverted bucket movable within said float chamber;
supply means in fluid communication with the interior of said bucket for supplying steam to said bucket causing said bucket to float and for supplying condensate to said float chamber causing said bucket to sink;
discharge means in fluid communication with said float chamber through a valve seat for discharging condensate from said float chamber;
a valve member movable into and out of engagement with said valve seat;
and coupling means between said valve member and said bucket for moving said valve member in response to movements of said bucket, said coupling means including a first lever connected to said bucket and mounted for pivotal movement about a first axis and a second lever carrying said valve member and mounted for pivotal movement about a second axis and for translatory movement away from said second axis along a predetermined third axis, said first and second levers coupled together at a point which moves about said first and second axes.

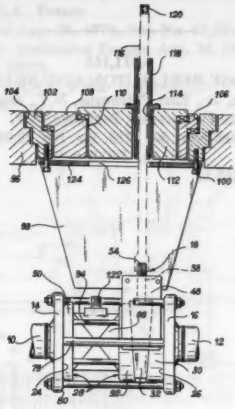
4,311,163

DISASSEMBLABLE DEVICE FOR FITTING A DEVICE BETWEEN THE OPPOSITE ENDS OF TWO PIPES

Bernard Langevin, Equeurdreville, France, assignor to Commissariat a l'Energie Atomique, Equeurdreville, France

Filed Jan. 25, 1980, Ser. No. 115,496
Claims priority, application France, Feb. 2, 1979, 79 02754
Int. Cl.³ F16K 43/00
U.S. Cl. 137—315 10 Claims

1. A disassemblable device provided for inserting an apparatus of the valve type between the opposite ends of two pipes defining a common axis, comprising two flanges adapted to be sealingly fixed to the said pipe ends, said device also comprises an axially extensible member constituting a unitary assembly for carrying said apparatus, said extensible member being normally extended and expanded between the flanges along the axis of the pipes so as to sealingly bear against at least one of the flanges and said apparatus to provide a communication between said pipes through a passage extending through said extensible member substantially along the axis of the pipes, said extensible member being adapted to be retracted from its expanded condition between the flanges along the axis of the pipes to allow dismounting of the apparatus carried by said unitary assembly said extensible member and said apparatus



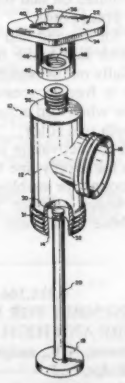
being in abutting side-by-side relationship between the flanges along the axis of the pipes.

4,311,164

VALVE HANDLE RETENTION SYSTEM

Elmer S. Welch, Silver Lake, Wis., assignor to Superior Stainless, Inc., Delavan, Wis.

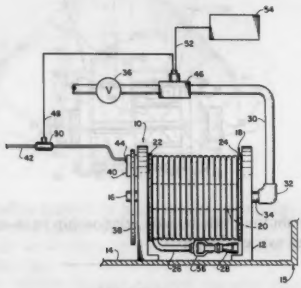
Filed Mar. 26, 1980, Ser. No. 134,168
Int. Cl.³ F16K 43/00
U.S. Cl. 137—315 11 Claims



1. A valve assembly including a valve body having a fluid entrance and a fluid exit, a valve plug longitudinally movable within said valve body, a valve stem disposed longitudinally through said valve body connecting said valve plug to a valve handle, means for securing said valve handle to said valve body, means for removing said valve handle from said valve body, said valve handle including a valve stem retaining notch and an adjoining valve stem receiving aperture larger than a diameter of a handle connecting portion of said valve stem and means extending within said aperture for engaging said valve stem when said valve handle is removed from said valve body when sufficient force is applied to said means for engaging said valve stem to force said valve stem engaging means radially outwardly from said aperture so that said valve stem can be released from said valve handle through said aperture and said

handle connecting portion cannot fit through said aperture freely thereby maintaining said handle connecting portion of said valve stem within said aperture until said valve stem engaging means is forced radially outwardly from said aperture.

4,311,165
HOSE REEL AUTOMATIC BRAKE
George R. Rose, Jr., East Patchogue, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Nov. 30, 1979, Ser. No. 98,982
Int. Cl.[3] E03B 9/00
U.S. Cl. 137—355.12 13 Claims



1. In a reel for the stowage of a length of hose, a support mounting said reel on a shaft for rotation for the reeling and unreeling of said hose, a supply line for supplying fluid to said hose for dispensing therefrom, and means for braking the rotation of said reel, said braking means comprising, in combination:

a brake rotor fixed on said reel and rotating therewith;

a brake stator mounted on said support in operative association with said brake rotor;

a brake actuator for moving said brake stator into frictional engagement with said brake rotor, said stator normally being substantially out of engagement with said rotor such that said reel is free to rotate, said reel being braked against rotation when said actuator brings said stator into engagement with said rotor;

energizing means for activating said brake actuator; and

sensing means in the supply line for said hose responsive to a flow therethrough for enabling said energizing means to activate said brake actuator whereby a flow of fluid through said hose causes said reel to be braked against rotation.

4,311,166
VALVE ASSEMBLY FOR USE WITH HIGH TEMPERATURE AND HIGH PRESSURE FLUIDS
Angelo De Feo, Totowa, N.Y., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.
Filed Jun. 20, 1980, Ser. No. 161,284
Int. Cl.[3] F16K 3/30, 1/22
U.S. Cl. 137—375 19 Claims

1. A valve assembly capable of use with fluids of high temperature and pressure comprising:

a. inner and outer shells diametrically sized to form a first space therebetween;

b. a valve actuator support having coaxially disposed inner and outer tubular members diametrically sized to define a second space therebetween communicating with said first space.

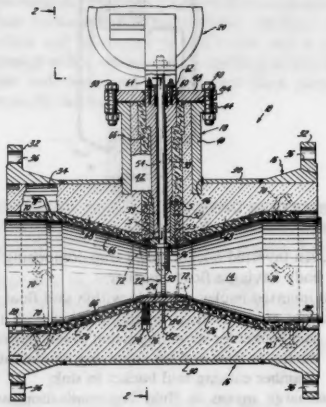
c. said inner tubular member has two telescopically arranged portions, one portion being secured to the outer shell while the other portion is secured to the inner shell;

d. a layer of resilient insulating material covering substantially all of the outer surfaces of said inner shell and of said inner tubular member of said valve actuator support and of a thickness to occupy part of the first and second spaces;

e. a body of refractory material disposed within the first and second spaces in the space remaining between the inner and outer shells and between the inner and outer tubular members;

f. a valve actuator means supported by said inner and outer tubular members and projecting into the inner shell;

g. a movable valve member in said inner shell and connected to the valve actuator means for movement to positions

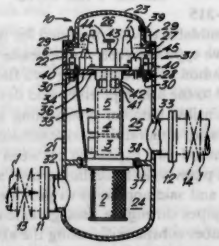


from a fully open to a fully closed position to thereby control fluid flow through said inner shell;

h. anchor means connected to said inner shell adjacent said movable valve member for securing said inner shell in the area of the movable valve against longitudinal movement relative to the outer shell and refractory body while not preventing radial movement of said inner shell relative to the outer shell and refractory body; and

i. connecting means at opposite ends of the inner and outer shell for connecting said shells to fluid conducting elements.

4,311,167
REGULATOR INSTALLATION FOR FLUID TRANSMISSION OR DISTRIBUTION SYSTEMS
Derek Stoves, St. Johns; Roger W. Hawkins, Benton, and Arthur B. Smelt, Allendale, all of England, assignors to British Gas Corporation, London, England
Filed Dec. 28, 1979, Ser. No. 107,919
Int. Cl.[3] F16K 27/00
U.S. Cl. 137—454.2 9 Claims



1. A regulator installation for controlling at least one param-

eter selected from the group consisting of pressure and flow of gas in a gas transmission or distribution system, wherein the regulator installation is in the form of a compact module comprising; an outer shell having a removable cover and an inlet and an outlet for connection in a gas pipeline of said system; a regulator assembly removeably secured to a part of said outer shell, which assembly includes main elements and control elements of said regulator installation; sealing means between said shell and said assembly for dividing the interior of said shell into a gas-tight high pressure upstream compartment which communicates with said inlet, a gas-tight low pressure downstream compartment which communicates with said outlet, and a compartment substantially at atmospheric pressure.

4,311,168

DIFFERENTIAL PRESSURE VALVE FOR A FUEL INJECTION SYSTEM

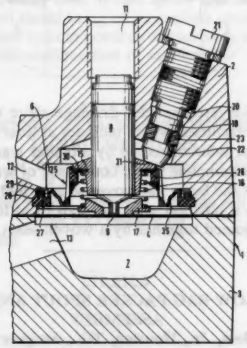
Klaus-Jürgen Peters, Affalterbach; Peter Stiefel, Ditzingen, and Heinz Ehrentraut, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 22, 1980, Ser. No. 123,534

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1979, 2910846

Int. Cl.³ E03B *3/18*

U.S. Cl. 137—549 **3 Claims**



1. A differential pressure valve for a fuel injection system of an internal combustion engine, a housing having first and second chambers, a movable diaphragm disposed in said housing between said first and second chambers, a valve seat carrier in said first chamber having a valve opening in one end thereof, a fuel supply line in said first chamber, a spring loaded assembly encompassing said valve seat carrier, said spring loaded assembly comprising one element in engagement with said diaphragm and a further element engaging said valve seat carrier in spaced relation to said diaphragm and a fuel filter in said chamber, further wherein said filter element has an end face that engages said further element engaging said valve seat carrier, further wherein said filter element has an area which is secured in a sealing manner on said one element in engagement with said diaphragm and said end face of said filter element is arranged in sliding engagement with said further element whereby a labyrinth seal is formed.

4,311,169

AIR-WATER MIXER FOR THE ATOMIZER OF A DENTAL HAND PIECE

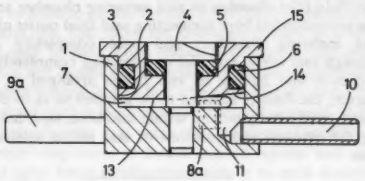
Roger Gaillard, Montferrand le Chateau, France, assignor to Micro-Mega, S.A., France

Filed Aug. 20, 1979, Ser. No. 67,891

Claims priority, application France, Aug. 24, 1978, 78 24972; Jul. 16, 1979, 79 18979

Int. Cl.³ F16K *11/00, 37/00*

U.S. Cl. 137—556 **8 Claims**



1. An air-water mixer for the atomizer of a dental hand piece, which comprises a body provided with a blind bore defining a circular mixing chamber into which open an air supply conduit, a water supply conduit and an outlet conduit, a selector ring rotatably including an inner face mounted in said body and rotatable for adjusting the supply of air and/or water into said chamber, said selector ring inner face defining an upper wall of said chamber, said blind bore and said inner face defining said chamber, said inner face of the ring having a flat sector rotatable to a position to close the inlet port of one and/or the other supply conduits in predetermined angular positions of said selector ring, and a sector on said inner face inclined from the center radially outwardly of said selector ring rotatable to a position to open the passage between one and/or the other supply conduit and the outlet conduit in other predetermined angular positions of said ring, means rotatably mounting said selector ring in said blind bore, and sealing means disposed in said mixer between said ring and said body to maintain the chamber fluidtight.

4,311,170

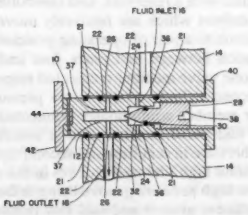
FLUID FLOWMETER VALVE

Stephen J. Dolan, Bellerose, N.Y., assignor to Precision Metering, Inc., Bellerose, N.Y.

Filed Jun. 2, 1980, Ser. No. 155,441

Int. Cl.³ F16K *3/26, 47/04*

U.S. Cl. 137—614.17 **3 Claims**



1. A combination needle flow control and shutoff valve for precision instruments comprising a body having a bore formed therein, fluid inlet and outlets ports communicating transversely with said bore, a sleeve slidably positioned within said bore for linear movement along the longitudinal axis of said bore, said sleeve being slidably movable in said bore between a first position in which the valve is open to allow fluid communication between said fluid inlet and outlet ports and a second

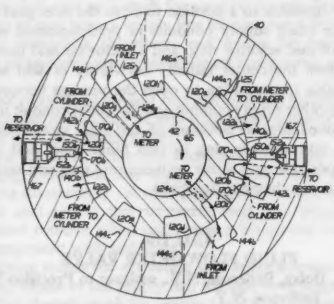
position in which the valve is closed to prevent fluid communication between said fluid inlet and outlet ports, said sleeve having a metering chamber for regulating the flow of fluid through the valve, and a needle control valve threadedly engaged to said sleeve and extending into said metering chamber to precisely regulate fluid flow therethrough when the sleeve is in said first position; said sleeve having a plurality of O rings positioned therearound and spaced along its length for sealing the sleeve relative to the bore and forming a fluid inlet chamber between a first pair of said O rings and a fluid outlet chamber between a second pair of said O rings; said valve including at least one first radial bore in said sleeve connecting said fluid inlet chamber to said metering chamber and at least one second radial bore connecting said fluid outlet chamber to said metering chamber; said bore completely extending through said body, said sleeve extending completely through said bore and having an end flange arranged at each end thereof, the flanges adapted to be gripped so as to enable said sleeve to be axially moved within said bore, said flanges defining the extreme end positions of said sleeve relative to said bore.

4,311,171

HYDROSTATIC STEERING CONTROLLER WITH PRESSURE DAMS

Maurice P. Roberts, Otterbein, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Sep. 22, 1978, Ser. No. 944,703
Int. Cl.³ F15B *13/04*
U.S. Cl. 137—625.23 **10 Claims**



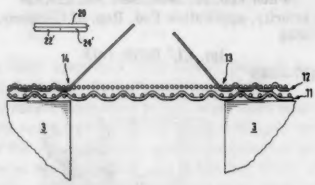
1. A controller comprising a housing having an inlet means for connection to a source, first and second cylinder ports for connection to opposite sides of a fluid motor, and an outlet port for connection with a reservoir, said controller including a pair of valve members which are relatively movable away from a neutral position to a pair of operating positions to control fluid communication between said ports, first and second cylinder grooves in one valve member connected respectively with said first and second cylinder ports, a low pressure groove in the other valve member continuously connected with said outlet port when said valve members are in neutral and when said valve members are in said first and second operating positions, first and second high pressure grooves in the other valve member, said first high pressure groove being in facing relation with said first cylinder groove and said low pressure groove being in facing relation with said second cylinder groove when said valve members are in said first operating position and said second high pressure groove being in facing relation with said second cylinder groove and said low pressure groove being in facing relation with said first cylinder groove when said valve members are in said second operating position, and means for forming a pressure dam between the first and second cylinder grooves when said valve members are relatively moved away from neutral by a predetermined amount to one of said first and second operating positions, said means forming a pressure dam including at least one pressure dam groove disposed in said one valve member between said first and second cylinder grooves, a fluid pressure area within said housing, said fluid pressure area being connected with said inlet means, said pressure dam groove being in continuous fluid communication with said fluid pressure area when said valve members are in neutral and when said valve members are in said first and second operating positions, said low pressure groove being in facing relation with said pressure dam groove when said valve members are in said neutral position, said low pressure groove being movable out of facing relation with said pressure dam groove and said other valve member including surface means movable into facing relation with said one pressure dam groove to create a pressure dam chamber within said one pressure dam groove in response to a predetermined amount of relative movement of said valve members away from neutral and to said first or second operating position.

4,311,172

MULTI-LAYER SPLICED DRAINAGE SIEVE BELT AND METHOD FOR SPLICING SAME

Konrad Eckstein, Pfullingen, Fed. Rep. of Germany, assignor to Hermann Wangner GmbH & Co. KG, Reutlingen, Fed. Rep. of Germany

Filed Jan. 11, 1980, Ser. No. 111,499
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1979, 2902880
Int. Cl.³ D03D *25/00*
U.S. Cl. 139—383 A **12 Claims**



1. A multi-layered spliced drainage sieve belt, for use in paper drying facilities, which includes at least a top layer and a bottom layer interconnected by a binder warp, each of said layers being a complete fabric comprised of warp threads and filling threads and being flat woven so as to include ends which meet to form a junction with the ends of at least one of said layers being joined together by a woven seam.

4,311,173

AIR FLOW BAG PACKER SPOUT AND HOOD ASSEMBLY

Clyde A. Sailors, Jr., Houston, Tex., assignor to Continental Carbon Company, Houston, Tex.

Filed Mar. 3, 1980, Ser. No. 126,650
Int. Cl.³ B65B *1/18*
U.S. Cl. 141—68 **9 Claims**

1. A spout and hood assembly for an air flow bag packer comprising:

an elongate horizontally-disposed filling spout comprising a first product supply tube of circular cross section surrounded by an outer tubular shell having oval-shaped cross section in a horizontal plane, said supply tube and shell terminating at their discharge ends in the form of an inclined edge facing downwardly;

the outer bottom surface of said supply tube engaging the inner bottom surface of said shell;

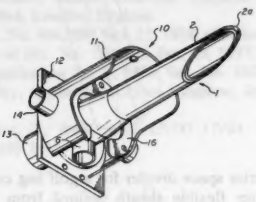
said shell being tapered to provide a space between said supply tube and said shell which defines a vent area therebetween of area cross section which increases from said inclined edge toward the opposite end of said spout;

said opposite ends being affixed to a mounting flange, said

flange having a circular orifice therethrough of the same diameter of the inner diameter of said supply tube;

a pressure relief connection connected to said outer shell in communication with said vent area at said opposite end of said shell;

a dust hood assembly comprising a hollow generally cylindrical hood open at one end and affixed to a mounting plate at the opposite end, said hood being of incomplete circular configuration at the bottom thereof; said mounting plate having an orifice therethrough; a second product supply tube affixed to the outside of said mounting plate and sharing a common axis with said hood, the inside diameter of said second supply tube being equal to and



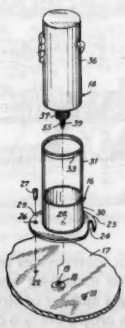
conforming to the diameter of said mounting plate orifice; at least one cylindrical connector affixed to the side of said hood adjacent said mounting plate; a generally circular dust shield mounting ring affixed to the inside of said hood between the said connectors and the open end of said hood; and a flat dust shield, affixed to said dust shield mounting ring, said dust shield being of generally circular outside configuration and an inside configuration conforming to but greater in size than the outside configuration of said outer shell of said spout; said mounting ring and said dust shield being of incomplete circular configuration at their bottom portions conforming to the incomplete circular configuration of said hood.

4,311,174

SAFETY DISPENSER ATTACHMENT FOR DANGEROUS LIQUID ADDITIVES

John M. Walsh, III, Madison, N.J., assignor to Bull & Roberts, Inc., Murray Hill, N.J.

Filed May 5, 1980, Ser. No. 146,669
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—383 **7 Claims**



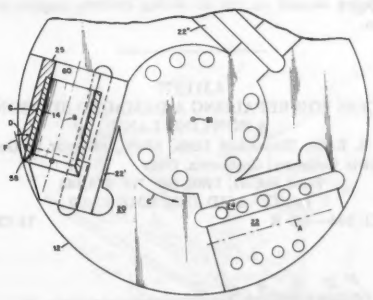
1. A safety dispenser attachment for the dispensing of corrosive or like liquid additives adapted to be affixed to a tank or the like comprising a base member having an aperture formed therethrough, means on said base member for attaching the same to a dispenser tank, a skirt portion extending from one side of said base member and surrounding said aperture, gripper means formed on the wall of said aperture, a yieldable container member rotatably mounted within said skirt and including a closed end portion extending therebeyond, said container member having at its other end a closeable spout assembly including an elongate, resiliently deformable spout having an internal thread portion, a complemental thread portion formed on said container in threaded engagement with said spout, a valve member interposed between said spout and said container, said valve member being shifted to a sealed position responsive to relative rotation of said spout and container in a first direction and being shifted to an open position responsive to relative rotation of said spout and container in an opposite direction, said spout and container being free wheeling in said open position when relatively rotated in said opposite direction and locked against relative rotation in said sealed position when rotated in said first direction, said spout including an external surface portion force fittingly engaged within said aperture whereby said spout may be rotated relative to said container responsive to forces exerted against said container, said spout being readily removable in an axial direction from said force fitted engagement responsive to combined radial and axial removing forces exerted on said spout and being resistant to axial displacement from said force fitted engagement responsive to axial forces only exerted against said spout, whereby said container can conveniently be removed from said base member only when said valve is in the sealed position.

4,311,175

LOG CUTTER

Byron B. Drummond, 837 S. Germantown Rd., Chattanooga, Tenn. 37412

Filed May 23, 1980, Ser. No. 152,837
Int. Cl.³ B27L *11/02*
U.S. Cl. 144—241 **4 Claims**



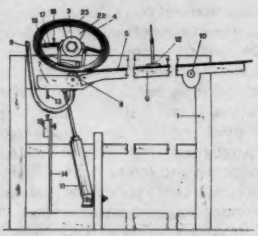
1. Apparatus for reducing a log tc chips comprising a rotatable circular disc cutter head adapted for translational movement relative to a log, said cutter head carrying a cutting element, said element comprising a length of open-ended tubular material having a leading beveled cutting edge which attacks the log to cut away a chip which travels away from the log through said tubular cutting element, means releasably mounting said cutting element on said cutting head with the longitudinal side margin of said cutting element oriented at about 37 degrees with respect to a tangent to the outer circumference of said disc at the intersection of said side margin with said circumference and at an angle of about 15 degrees with respect to a planar face of said disc, said last means comprising a base member defining a cradle and means securing said cutting element in said cradle.

4,311,176

MACHINE FOR MANUFACTURING CURVILINEAR CONVEX WOODEN FRAMES

Fiore B. Cavallaris, Venice, Italy, assignor to Closeform S.r.l., Venice, Italy

Filed Jul. 29, 1980, Ser. No. 173,386
Claims priority, application Italy, Mar. 4, 1980, 84118 A/80
Int. Cl.³ B27H 1/00
U.S. Cl. 144—268 12 Claims



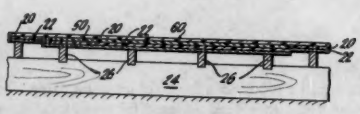
1. A machine for manufacturing curvilinear convex wooden frames of a desired thickness comprising a base frame, a strip guiding and feeding bench rockably mounted on the base frame and having an upper surface on which a wooden strip can be supported, a variable profile curvilinear pattern mounted on the base frame above a swinging end portion of the bench, means to drive the pattern in rotation so that a wooden strip attached to the pattern can be wound thereon as the strip is pulled across said bench, and yielding biasing means connected with the bench enabling the bench to gradually move away from the axis of the revolving pattern due to an increase in thickness of a wooden frame being produced, said yielding biasing means allowing the bench to oscillate relative to the base frame in synchronism with the revolving of the pattern, whereby the bench can maintain the feeding plane of a wooden strip being wound on the revolving pattern tangent to the pattern.

4,311,177

PROCESS FOR REPAIRING A DAMAGED SECTION OF A BOWLING LANE

Peter B. Kelly, Bloomfield Hills, Mich., assignor to General Electric Company, Coshocton, Ohio

Filed Jul. 31, 1980, Ser. No. 174,148
Int. Cl.³ A63D 1/04; B32B 35/00
U.S. Cl. 144—310 R 11 Claims



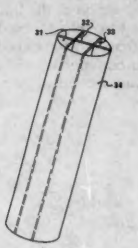
1. A process for repairing a damaged bowling lane including a support substructure and a planar upper surface forming the bowling lane, said process comprising the steps of:
(a) cutting and removing the section of the planar upper surface having the damaged portion therein;
(b) resurfacing said section with a hard, dense, tough sheet material to resist ball drop deformation;
(c) adjusting, by reducing, the height of the substructure to permit the flush reinsertion of the resurfaced section into the bowling lane; and
(d) resurfacing the entire planar upper surface of the bowling lane.

4,311,178

INTERIOR SPACE DIVIDER FOR GOLF BAG

Robert A. Kennedy, 600 E. Barber Dr., Hemet, Calif. 92343

Continuation-in-part of Ser. No. 81,653, Dec. 5, 1979, abandoned. This application Dec. 1, 1980, Ser. No. 211,727
Int. Cl.³ A63B 55/00
U.S. Cl. 150—1.5 R 4 Claims



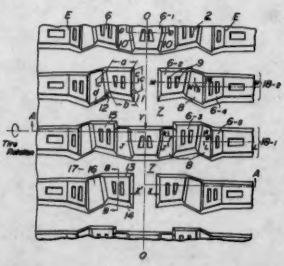
1. An interior space divider for a golf bag comprising:
(a) an outer flexible sheath defined from a single sheet wrapped to define a generally cylindrical shape;
(b) a plurality of generally planar, rigid, divider panels dimensioned to extend the substantial length of said golf bag to subdivide the cross sectional area thereof into compartments; and
(c) locater means on said sheath for engaging and positioning said divider panels in predetermined orientations in said bag, said locater means comprising a plurality of spaced slots and said panels being generally rectangular with laterally projecting tabs engated in said slots.

4,311,179

MOTOCROSS TIRE FOR MOTORCYCLES

Toshio Hayakawa, Higashimurayama, and Shoji Yoshida, Higashikurume, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Nov. 8, 1979, Ser. No. 92,309
Claims priority, application Japan, Nov. 27, 1978, 53-145252; Nov. 27, 1978, 53-145253
Int. Cl.³ B60C 11/06
U.S. Cl. 152—209 R 9 Claims



1. In a motocross tire for motorcycles having a pair of bead portions, a toroidal carcass extending across said bead portions, and a tread including a number of blocks having an outer surface extending from the crown portion of said carcass along the contour of said carcass to both sides of the tread and spaced apart from each other by transverse grooves and longitudinal grooves, the improvement comprising; said blocks are divided into a plurality of block groups extending in the widthwise direction of the tread and including a block group having adjacent blocks whose centers are circumferentially displaced by 3 to 25 mm and all of the blocks are arranged such that the

total sum of lengths of the block outer surfaces measured at any portion between tread ends in the circumferential direction of the tread is a value within a range between 20% and 30% of the circumferential length of the tread, a ratio of a net ground contact area of the blocks to the gross ground contact area of the tire changes within a range of ± 0.05 in response to a change in the chamber angle of the tire, and each of said blocks is formed of tread rubber having a 300% modulus of elasticity of 70 to 160 kg/cm^2 and a Shore A hardness of 55° to 75°.

4,311,180

PNEUMATIC TIRE CAPABLE OF BEING DRIVEN DEFLATED

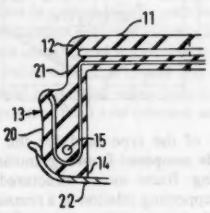
William L. Jackson, Sutton Coldfield, England, assignor to Dunlop Limited, London, England

Division of Ser. No. 944,899, Sep. 22, 1978, abandoned, which is a continuation of Ser. No. 759,015, Jan. 13, 1977, abandoned. This application Jul. 7, 1980, Ser. No. 166,193

Claims priority, application United Kingdom, Jan. 27, 1976, 03170/76

Int. Cl.[3] **B60C** *5/02, 13/00, 17/04*

U.S. Cl. 152—330 RF **6 Claims**



1. A pneumatic tire and wheel assembly, the tire comprising a braced tread, two beads, two sidewalls each extending between the tread and one of the beads wherein, when the assembly is un-inflated and not mounted on a vehicle, the sidewalls are under tension radially of the tire.

4,311,181

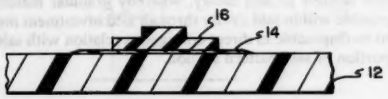
AMBIENT TEMPERATURE APPLICATION OF INDICIA TO ELASTOMER SUBSTRATES

Walter R. Hausch, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 73,760, Sep. 10, 1979, abandoned. This application Jun. 5, 1980, Ser. No. 156,893

Int. Cl.[3] **B60C** *13/00;* **B32C** *25/04, 25/12;* **B32B** *25/08, 27/08, 27/04;* **A01G** *25/09;* **B65G** *15/42*

U.S. Cl. 152—353 R **10 Claims**



1. An indicia residing on a substrate, comprising:

a cured elastomer substrate;

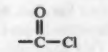
an amine cured prepolymer or polymer, said amine cured prepolymer or polymer cured at ambient temperature;

a layer of a treating agent, said treating agent residing between said elastomer substrate and said amine cured prepolymer or polymer and forming a strong bond therebetween, said treating agent selected from the group consisting of the N-halohydantoins, the N-haloamides, and the N-haloimides;

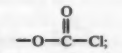
said amine cured prepolymer or polymer being in the form of an indicia;

said substrate being an elastomer made from monomers selected from the group consisting of (a) dienes having from 4 to 12 carbon atoms, copolymers thereof, and interpolymers thereof, (b) natural rubber, (c) copolymers made from vinyl substituted aromatic compounds having from 8 to 15 carbon atoms and diene compounds having from 4 to 12 carbon atoms, (d) elastomers made from monomers of isobutylene and isoprene, (e) elastomers made from monomers of butadiene and acrylonitrile, (f) elastomers made from monomers of chloroprene, and (g) combinations thereof; and

wherein said prepolymer or polymer is selected from the group consisting of (a) epoxy resins; (b) halogen-containing hydrocarbon polymers; (c) chlorosulfonated polymers; (d) polymers containing acid halide groups such as



and haloformate groups such as



(e) polymers containing anhydride groups which, on reaction with diamines, yield amide-acid linkages; (f) organopolysiloxanes; (g) urethane polymers or prepolymers; and combinations thereof.

7. An indicia according to claims 1, or 6 wherein said elastomer substrate is a tire.

4,311,182

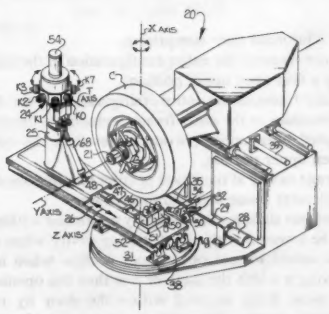
TIRE TREAD GROOVING APPARATUS AND METHOD

Andrew R. Clayton, Salisbury, N.C., assignor to Brad Ragan, Inc., Spruce Pine, N.C.

Continuation-in-part of Ser. No. 6,517, Jan. 25, 1979, Pat. No. 4,237,955. This application Dec. 5, 1980, Ser. No. 213,320

Int. Cl.[3] **B29H** *21/08*

U.S. Cl. 157—13 **13 Claims**



1. In an apparatus for forming a predetermined grooved tread design in tread rubber applied to a tire, said apparatus including tire mounting means for supporting a tire for rotation about a predetermined axis, knife means for forming grooves in tread rubber previously applied to the tire, means mounting said knife means for relative movement between said knife means and the tread surface of the tire, and programmable memory means for controlling relative movement between said knife means and said tire mounting means to form grooves in the tread surface of the tire and of any selected one of a plurality of different configurations, the improvement in said means mounting said knife means comprising turret means for mounting a plurality of knives of a plurality of configurations

for forming a corresponding plurality of configurations of grooves, and drive means operatively connected with and responsive to said programmable memory means for moving a selected one of said plurality of knives into engagement with the tread surface of a tire and along a predetermined path through tread rubber applied thereto.

4,311,183

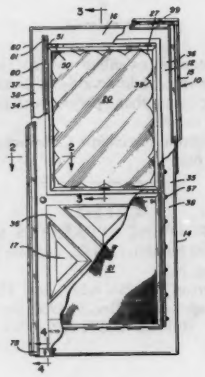
COMBINATION STORM AND SCREEN SELF STORING DOOR

Walter Herbst, 86 Salem La., Cook County, Evanston, Ill. 60203, and Robert A. Pascal, 1350 Forest, Lake County, Highland Park, Ill. 60035

Continuation-in-part of Ser. No. 652,126, Jan. 26, 1976, abandoned, and a continuation-in-part of Ser. No. 770,080, Feb. 18, 1977, abandoned. This application Oct. 6, 1978, Ser. No. 949,146

Int. Cl.³ E06B *9/00*

U.S. Cl. 160—37 **27 Claims**



1. A reinforced door comprising,

an outer frame of the entire configuration of the door including a first open upper portion,

an inner frame of the entire configuration of the door complimentary to the outer frame, including a second uninterrupted open upper portion larger than the outer frame open upper portion,

a storage cavity at the lower portion of said door defined by said outer frame and said inner frame,

at least one sliding panel slidingly positioned within the door to be lowered within said storage cavity when not in use and raised to said open upper portion when in use and having a width the same or less than the opening,

said panel being secured within the door by retractable means which, when retracted permit said panel to be removed through the uninterrupted open section portion,

a side reinforcement beam sandwiched between said outer frame and said inner frame along a lateral side of said door,

an expansion joint for receiving fastening means to secure the side reinforcement beam sandwiched between said outer frame and said inner frame along a lateral side of said door to permit expansion and contraction of the outer and inner members to retain dimensional stability,

whereby said door is structurally reinforced and dimensionally stable to permit all panels to be removed from the inside of the door, and to permit the door to resist warpage.

4,311,184

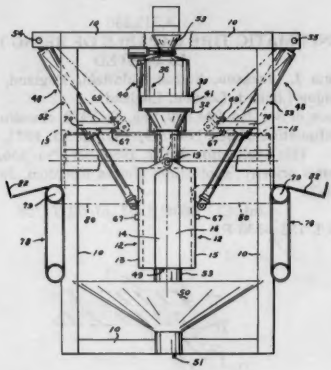
ASSEMBLY FOR FORMING HOLLOW FOUNDRY PRODUCTS

Anatol Michelson, 3235 Pine Valley Dr., Sarasota, Fla. 33579

Division of Ser. No. 44,774, Jun. 1, 1979, abandoned. This application Sep. 16, 1980, Ser. No. 187,716

Int. Cl.³ B22C *9/12*

U.S. Cl. 164—165 **22 Claims**



1. An assembly of the type used for the production of foundry shell molds composed from a granular material, said assembly comprising: frame means structured and disposed into substantially supporting relation to a remaining portion of said assembly; catalyst gas supply means in fluid communication with a mold box assembly mounted on said frame means and disposable between an open and closed position, said mold box assembly comprising at least two separate non-permeable box sections at least one of which is pivotally attached to said frame and movable in a single plane into and out of sealing engagement with the other; gas permeable pattern means having a predetermined configuration mounted within said mold box assembly and including at least one pattern section mounted within said at least one pivotally attached box section, said pattern section disposed in spaced apart relation from said other box section to form a cavity on an interior portion of said pattern means and being disposed in spaced apart relation from a base portion of said pivotally attached box section, the boundry of said cavity being at least partially defined by a working surface of said pivotally attached box section when said mold box assembly is in its closed position; investment means including an outlet having its axis disposed in said single plane of movement and further disposed in direct communication relative to said cavity, whereby granular material is disposable within said cavity through said investment means so as to be disposable in direct contiguous relation with said interior portion of said pattern section.

4,311,185

INJECTION PISTON FOR DIE CASTING

Rene Zimmerman, Bischofszell, Switzerland, assignor to Gebrueder Buehler AG, Switzerland

Filed Jul. 17, 1979, Ser. No. 58,189

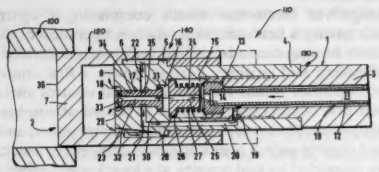
Claims priority, application Switzerland, Jul. 19, 1978, 7813/78

Int. Cl.³ B22D *17/10, 17/20*

U.S. Cl. 164—315 **22 Claims**

1. An injection piston in a die casting machine comprising, a press die having interior walls defining a chamber therein open at one end, a die rod having an end slidable in said chamber through said open end thereof, said die rod movable to move said press die under pressure into a mold, said die rod defining a coolant feed path into said chamber for the passage of coolant

at a working pressure and a coolant discharge path for the passage of coolant out of said chamber, an immersion valve movably mounted in said feed path which is exposed to said working pressure of the coolant on one side and a pressure of coolant in said chamber on another side thereof, said immersion valve being in a neutral position for the passage of coolant through said feed and discharge paths when said chamber pressure in less than said working pressure, and in a first operating position for the blockage of coolant in said feed and discharge paths when said chamber pressure at least equals said working pressure and in a second operating position for the passage of coolant in said discharge path but not in said feed path when said chamber pressure exceeds said working pressure by a selected amount, and restraining means engaged with said immersion valve when it is in said first operating position for restraining said immersion valve from moving to said second operating position until said selected amount is reached.

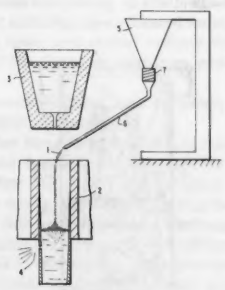


4,311,186

METHOD FOR QUICKLY REPAIRING BREAK-OUTS IN CONTINUOUS CASTING PLANTS

Antonio Spaccarotella, Via Como No 6, Roma, Italy

Filed Sep. 18, 1980, Ser. No. 188,533
Int. Cl.³ B22D *11/10, 11/16*
U.S. Cl. 164—453 **5 Claims**



1. In a method of continuously casting an ingot including supplying liquid metal from a pour vessel into continuous casting mold and withdrawing an ingot having a solidified skin from the mold; the improvement comprising the steps of

detecting the occurrence of a break-out of liquid metal through a crack in the solidified skin of the ingot;

interrupting the flow of liquid metal to the mold;

adding to the liquid metal in the mold cooling metal powders having a grain size 0.1 mm to 5 mm at a rate of 5 to 100 Kg/min, the metal powders melting endothermically upon contact with the liquid metal and causing rapid cooling of the liquid metal to seal the crack in the solidified skin; and

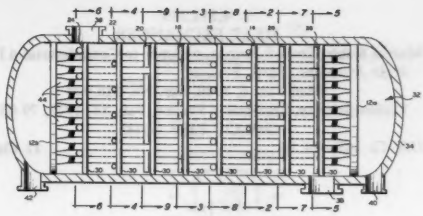
resuming the flow of liquid metal to the mold after a period of time between 0.1 minute and 5 minutes.

4,311,187

VORTEX GENERATORS

William M. Small, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 29, 1979, Ser. No. 98,576
Int. Cl.³ F28F *9/24*
U.S. Cl. 165—1 **17 Claims**



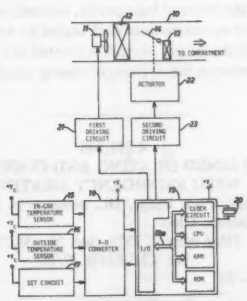
1. A process for improving the heat transfer coefficient of a tube bundle having a plurality of tubes positioned to form a first and a second plurality of parallel tube rows with the first plurality of parallel tube rows defining a first plurality of parallel lanes and said second plurality of parallel tube rows defining a second plurality of parallel lanes comprising providing said tube bundle with a first plurality of non-supportive vortex generators extending completely across the tube bundle in a plane which is about normal to the longitudinal axis of the tube bundle in at least a portion of the lanes of said first plurality of parallel lanes.

4,311,188

CONTROL METHOD AND APPARATUS FOR AIR CONDITIONERS

Yasuhumi Kojima, Gifu; Teiichi Nabeta, Okazaki, and Fumio Otuka, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 1, 1980, Ser. No. 145,877
Claims priority, application Japan, May 9, 1979, 54-57215
Int. Cl.³ F25B *13/00*
U.S. Cl. 165—2 **12 Claims**



1. A method for controlling an air conditioner including first control means for controlling the quantity of air flow discharged from the air conditioner into a compartment and second control means for controlling the temperature of air flow, said method comprising the steps of:

determining the quantity of heat necessary for adjusting the actual temperature of air in said compartment to a desired value and maintaining it at the same;

determining the quantity of air flow in accordance with the actual ambient temperature outside said compartment;

determining the temperature of air flow in relation to the

determined quantity of air flow necessary for discharging the determined quantity of heat into said compartment; and

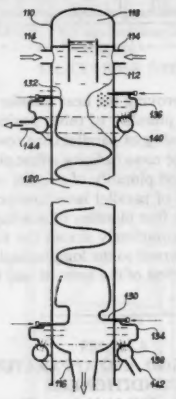
controlling each setting of said first and second control means in response to the determination of the quantity and temperature of air flow.

4,311,189

HEAT EXCHANGER

Marcel Robin, Sevres, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 6, 1980, Ser. No. 118,929
Claims priority, application France, Feb. 14, 1979, 79 03746
Int. Cl.³ F28F *11/00*
U.S. Cl. 165—11 R **11 Claims**



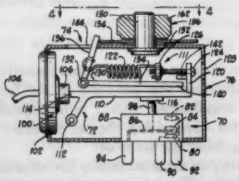
1. An exchanger which incorporates a casing in which the heat carried by a primary fluid is transferred to a secondary fluid so as to heat the latter, the secondary fluid circulating in tubes whose opposite ends issue into tubular supply and discharge mains located externally of the exchanger casing and surrounding the latter at least partly, wherein each of the tubes comprises two access devices each sealed by a removable plug, whilst each of the access devices is located in a part of the tube positioned between the exchanger casing and the corresponding main.

4,311,190

SELF CONTAINED HEATING AND COOLING SYSTEM WITH EMERGENCY HEATING

Don C. Walley, Park Ridge, Ill., assignor to Ranco Incorporated, Columbus, Ohio

Filed May 7, 1979, Ser. No. 36,774
Int. Cl.³ F25B *29/00*
U.S. Cl. 165—25 **5 Claims**



1. A self-contained heating and cooling system for a space comprising:

(a) a heat pump unit having a heat exchanger for heating and cooling air in the space;

(b) auxiliary heating means for heating air in the space;

(c) a support housing for said heat pump unit and said auxiliary heating means;

(d) a cycling thermostat for governing operation of said heat pump unit and said auxiliary heating means to enable establishment of a predetermined air temperature in the space; and,

(e) changeover thermostat means comprising a control switch having a first condition wherein operation of said auxiliary heating means is enabled, and a second condition for disabling said auxiliary heating means, a first control switch operator means for operating said control switch to said first condition in response to sensed atmospheric air temperature below a predetermined temperature, and a second control switch operator means comprising a mechanism supported by said housing at a location accessible to a user of the system, said mechanism supported for actuation to effect operation of said control switch to said first condition regardless of atmospheric air temperature levels sensed by said first control switch operator means;

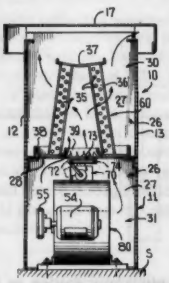
(f) said first control switch operator means comprising an expansible chamber actuator, a capillary tube extending from said actuator to a location exposed to atmospheric air, an expansible and contractible fluid filling said actuator chamber and capillary tube and, a lever reacting between said expansible chamber actuator and said control switch and supported for pivotal motion to actuate said control switch in response to expansion and contraction of said expansible chamber actuator.

4,311,191

HEAT-AUGMENTED HEAT EXCHANGER

Gerry VanderVaart, Niagara Falls, Canada, assignor to Kool-Fire Ltd., Niagara Falls, Canada

Filed Jul. 3, 1979, Ser. No. 54,647
The portion of the term of this patent subsequent to Jan. 19, 1999, has been disclaimed.
Int. Cl.³ F25B *29/00*
U.S. Cl. 165—29 **27 Claims**



1. A heat exchanger comprising outdoor coil means for circulating therethrough a heat-exchange medium, said outdoor coil means having an inlet and an outlet for respectively receiving and discharging the heat-exchange medium in respective liquid and vapor phases, compressor means in fluid communication with said outlet for compressing the vapor phase of the heat-exchange medium, means for effecting ambient air flow relative to said outdoor coil means at temperatures above a predetermined ambient temperature during the heating phase of said heat exchanger to absorb heat from ambient air, means at said outdoor coil means for generating heat immediately adjacent said outdoor coil means to augment ambient air temperature sufficient to transform the liquid phase of the heat-exchange medium to its vapor phase during the passage of

the heat-exchange medium from said inlet to said outlet with substantially total absorption of the heat by the heat-exchange medium during a heat-augmented phase of said heat exchanger at a temperature below said predetermined ambient temperature, and control means for rendering said ambient air flow means inoperative at and below said predetermined ambient temperature and rendering said heat generating means operative at and below said predetermined ambient temperature to generate heat at said outdoor coil means whereby said ambient air flow means is ineffective during the operation of said heat generating means and the heat generated by the latter during the heat-augmented phase of the heat exchanger is substantially totally absorbed by the heat-exchange medium.

4,311,192

HEAT-AUGMENTED HEAT EXCHANGER

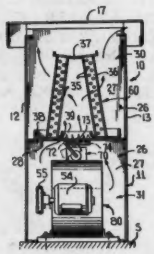
Gerry VanderVaart, Niagara Falls, Canada, assignor to Kool-Fire Limited, Niagara Falls, Canada

Continuation-in-part of Ser. No. 54,647, Jul. 3, 1979. This application Oct. 22, 1979, Ser. No. 87,154

The portion of the term of this patent subsequent to Jan. 19, 1999, has been disclaimed.

Int. Cl.³ F25B *29/00*

U.S. Cl. 165—29 **31 Claims**



1. A heating system comprising, in combination:

first indirect heat exchange means located for supplying heat to an interior space and second indirect heat exchange means located for absorbing heat from ambient, outside air;

said first and second indirect heat exchange means each including an inlet and an outlet;

compressor means for delivering high pressure refrigerant medium to said first heat exchange means and serially through said first and second heat exchange means;

expansion valve means located in the refrigerant flow path between said first and second heat exchange means for abruptly reducing the pressure of said refrigerant medium before it passes to said second heat exchange means;

air circulation means for passing ambient air in heat exchange relation across said second heat exchange means;

heat augmenting means at said second indirect heat exchange means for generating heat immediately adjacent said second heat exchange means independently of any heat supplied thereto by ambient air to transform the liquid phase of the refrigerant medium to its vapor phase during the passage of the refrigerant medium from said inlet to said outlet of said second heat exchange means with substantially total absorption of the heat by the refrigerant medium; and

control means for disabling said air circulation means and enabling said heat augmenting means in response to selected temperature of ambient air at which the ambient air temperature is alone ineffective to maintain efficient operation of the system.

4,311,193

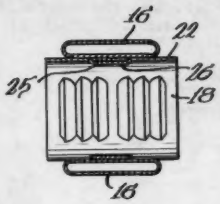
SERPENTINE FIN HEAT EXCHANGER

Robert C. Verhaeghe, and Homer D. Huggins, both of Racine, Wis., assignors to Modine Manufacturing Company, Racine, Wis.

Filed Jul. 14, 1980, Ser. No. 167,815

Int. Cl.³ F28D *1/04*

U.S. Cl. 165—149 **11 Claims**



1. A heat exchanger, comprising:

spaced tubes for a first heat exchange fluid;

a rigid assembly comprising a serpentine fin of thin and flexible heat conducting metal having opposite sets of crests attached in heat exchange contact with an adjacent pair of said tubes and extending across the space between said tubes for contact with a second heat exchange fluid; and

an elongated, heat conducting, rigid member in addition to said tubes attached to each said set of crests.

4,311,194

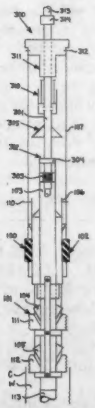
LINER HANGER AND RUNNING AND SETTING TOOL

Pat M. White, Lewisville, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Aug. 20, 1979, Ser. No. 67,779

Int. Cl.³ E21B *23/04*

U.S. Cl. 166—120 **18 Claims**



1. Apparatus for anchoring a string of well bore liner in a well comprising: a tubular body mandrel; an expandible seal on said body mandrel for sealing between said mandrel and the wall of said well; normally retracted expandible gripping means on said mandrel for locking said mandrel with the wall of said well; separate hydraulic means removably connected with said body mandrel for expanding said gripping means; and mechanical force applying means connected with said hydraulic means for mechanically releasably engaging said body mandrel to mechanically expand said seal after hydraulically expanding said gripping means; said hydraulic and mechanical

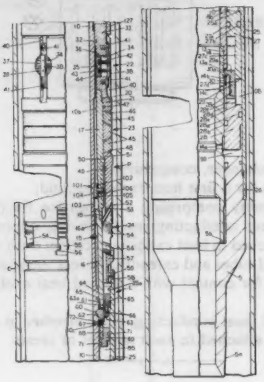
force applying means being disengageable and removable from said body mandrel after expanding said gripping means and said seal.

4,311,195

HYDRAULICALLY SET WELL PACKER

Albert A. Mullins, II, Humble, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Jul. 14, 1980, Ser. No. 168,961
Int. Cl.³ E21B 33/128
U.S. Cl. 166—120 **12 Claims**



1. In a well conduit packer of the type having an elongated tubular body connectible in a running tubing string, said tubular body comprising co-axially disposed and relatively movable inner and outer mandrels, normally retracted slip means on said tubular body operable by relative movement of said mandrels to expand said slip means into engagement with the conduit, resilient packing means on the body deformable into sealing engagement with the conduit by said relative movement of said mandrels and means responsive to the pressure of fluid in the bore of said body for producing relative axial movement of said mandrels, the improvement comprising: a member surrounding the lower portions of said outer mandrel and extending axially below the end of said inner mandrel, and means mounted on said member for closing fluid passage through the packer, whereby tubing pressure may then be raised, said inner mandrel being axially shiftable upwardly under the influence of said tubing pressure to facilitate the action of said pressure responsive means.

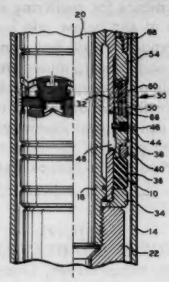
4,311,196

TANGENTIALLY LOADED SLIP ASSEMBLY

Clifford H. Beall, Broken Arrow, Okla., and Albert A. Mullins, II, Humble, Tex., assignors to Baker International Corporation, Orange, Calif.

Filed Jul. 14, 1980, Ser. No. 168,962
Int. Cl.³ E21B 33/129
U.S. Cl. 166—134 **33 Claims**

1. An apparatus for securing a tool to the interior wall of a conduit in a subterranean well, comprising: a plurality of wedge-shaped arcuate slip elements spaced about the periphery of the tool in side-by-side relationship, each of said slip elements tapering from a wider end to a narrower end along the longitudinal axis of the conduit in the well bore, at least one of said slip elements having an outwardly facing annular segment surface for cooperation with the interior wall of the conduit in the well bore and extending between said wider and narrower ends; means for cooperatively interengaging said slip elements with the tool for radial and longitudinal movement with respect to the tool; and setting means for relatively moving said slip elements along the longitudinal axis of the tool and toward said interior wall to force said slip elements radially outwardly and to engage said outwardly facing surfaces onto the interior wall of the conduit to secure the tool against longi-



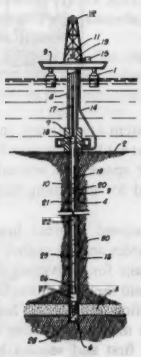
tudinal movement in at least one direction, whereby said slip elements bear against one another in a tangential direction and distribute thereacross stress in the conduit at the point of contact with said outwardly facing surfaces.

4,311,197

ANNULUS PRESSURE OPERATED CLOSURE VALVE WITH IMPROVED REVERSE CIRCULATION VALVE

Donald F. Hushbeck, Duncan, Okla., assignor to Halliburton Services, Duncan, Okla.

Filed Jan. 15, 1980, Ser. No. 112,199
Int. Cl.³ C21B 34/08
U.S. Cl. 166—373 **26 Claims**



1. In combination with an apparatus for use in a well, said apparatus including:

a cylindrical housing having an open bore therethrough, and a power port and a circulating port through the walls thereof;

a power mandrel in said open bore having an annular piston for moving said power mandrel in a first direction responsive to fluid pressure exterior of said cylindrical housing communicated to said annular piston through said power port;

frangible restraining means between said power mandrel and said cylindrical housing for restraining movement of said power mandrel in the first direction until the pressure exterior of said housing exceeds a predetermined value, and for frangibly releasing said power mandrel when said pressure exterior of said housing exceeds said predetermined value;

closure valve means in said cylindrical housing having a

normally open position and a closed position for providing a flow passageway through the open bore in said housing when in the normally open position;

connecting means connecting said closure valve means to said power mandrel including means for moving said closure valve from the open position to a closed position responsive to movement of said power mandrel in the first direction;

first releasing means in said connecting means for selectively releasing said connecting means from said power mandrel after said power mandrel has moved a predetermined distance in the first direction; and

circulation valve means in said housing including a sliding valve mandrel having a normally closed position closing said circulating port and an open position opening said circulating port, said circulation valve means including means for moving said sliding valve mandrel from the closed position to the open position responsive to a predetermined amount of movement of said power mandrel in the first direction;

the improvement comprising:

said circulation valve means including shear pin means for initially retaining said sliding valve mandrel in said normally closed position; and

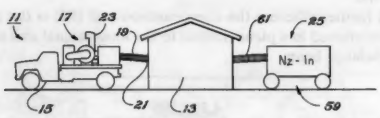
said sliding valve mandrel being arranged for engagement with said power mandrel upon movement of said power mandrel in said first direction, so that said sliding valve mandrel is forced in said first direction by said engagement with said power mandrel and said shear pin means is sheared to release said sliding valve mandrel.

4,311,198

SMOKE REMOVAL APPARATUS WITH SUCTION OR BLOWING AND DIRECTIONAL DISCHARGE OPTIONS

Pete C. Vasquez, 1607 NW. 23rd St., Fort Worth, Tex. 76106

Filed Dec. 26, 1979, Ser. No. 106,700
Int. Cl.³ A62C 27/28
U.S. Cl. 169—11 **3 Claims**



1. Apparatus for removing smoke from an enclosure, comprising:

a. truck means for transporting a suction-blower unit;

b. a powered suction-blower unit carried by said truck means; said suction-blower unit also including an inhalation unit and having a capability of creating a suction below atmospheric at its suction side and having a capability of creating pressure above atmospheric at its discharge side;

c. extensible first conduit means for conducting a fluid and connected at one end with said suction-blower unit;

d. a second conduit and a third conduit having respective valves therein for connecting alternatively and optionally said extensible conduit means with the suction side of said suction-blower unit for sucking smoke from said enclosure and with the discharge side of said suction-blower unit for blowing smoke from said enclosure, said second conduit being connected to the suction side of the suction-blower unit to withdraw smoke from the inhalation unit or withdraw fresh air or inert gas from a fourth conduit by the positioning of the valves in the second conduit, said third conduit being connected to the discharge side of the suction-blower unit to discharge gaseous fluid into the inhalation unit or to the fourth conduit by the positioning of the valves in the third conduit;

e. aperture engaging means for engaging an aperture in a portion of said enclosure for creating a movement potential for moving said smoke from within said enclosure; said aperture engaging means being connected with another end of said extensible first conduit means and adapted to engage the periphery of said aperture for minimizing fluid leakage; and

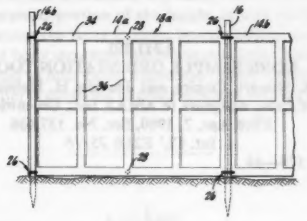
f. said fourth conduit connected at its first end with said suction-blower unit; said fourth conduit having at its second end an adjustable head that is pivotally mounted and adapted for pivotal movement about a vertical axis and in the horizontal plane to a desired azimuth and angularly adjustable with respect to horizontal for pointing its discharge opening in any direction, azimuth and elevation, at least above horizontal.

4,311,199

REUSEABLE PORTABLE FIREWALL

Josef Elias, 327 Cornwall St., San Francisco, Calif. 94118

Filed Jan. 7, 1980, Ser. No. 109,999
Int. Cl.³ A62C 7/00
U.S. Cl. 169—48 **5 Claims**



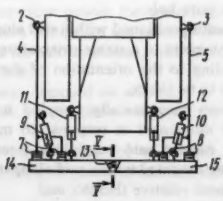
1. A portable and quickly erectable firewall for retarding the advance of outdoor fires comprising a plurality of panel modules of a fire resistant material, said panel modules constructed of a thin, lightweight sheet material stamped with raised borders and ribs for structural strength enabling panel stacking in nesting fashion for convenient storage and transportation, and support and flexible interconnection means for supporting and allowing rapid interconnection of the panel modules into a continuous vertical wall-like barrier across and in conformance with terrain.

4,311,200

BULLDOZER

Vladimir M. Lebedev, ulitsa Lesteva, 24, kv. 20, Moscow; Yan G. Dynchik, prospekt imeni Lenina, 74b, kv. 57, Chelyabinsk; Nikolai T. Kosarev, ploschad Revoljutsii, 1, kv. 84, Chelyabinsk; Vladilen S. Tanin-Shakhov, ulitsa Ovchinnikova, 15, kv. 5, Chelyabinsk, and Vladimir S. Tarasov, ulitsa Volodarskogo, 15, kv. 16, Chelyabinsk, all of U.S.S.R.

Filed Oct. 1, 1979, Ser. No. 80,254
Int. Cl.³ E02F 3/76
U.S. Cl. 172—826 **2 Claims**



1. A bulldozer comprising: a tractor, a non-angling blade, a pair of push arms, each push arm having one end articulated to

a respective lateral side of said tractor and another end pivotally mounted by a first joint means directly to a respective lateral end of said blade for rotation only about a single first generally horizontally extending axis fixed with respect to said blade, hydraulic cylinder means for lifting and tilting said blade, and compensating means for distributing load on the blade substantially symmetrically over said pair of push arms, said compensating means including a second joint means provided in the blade, the second joint having a single second generally vertical axis of rotation which is substantially perpendicular to first axis of rotation, whereby said first and second joint means define a 3-dimensional system of joints arranged in mutually perpendicular planes such that said blade can extend only laterally with respect to said tractor and can be tilted at varying angles in a vertical laterally extending plane and such that loads are not transmitted to said tractor through said second joint means, substantially all of the horizontal forces being transmitted to said tractor through said push arms.

4,311,201

CORE SAMPLE ORIENTATION TOOL

Daniel R. Stewart, Empire, and Joachim H. Heinicke, Golden, both of Colo., assignors to AMAX Inc., Greenwich, Conn.

Filed Apr. 7, 1980, Ser. No. 137,636

Int. Cl.³ E21B *25/16*

U.S. Cl. 175—44 **22 Claims**

1. A core sample orientation tool for use in obtaining core impressions in bore holes, comprising:

an elongate body member having an upper end and a lower end, said upper end including a coupling member adapted to be mechanically coupled to a bore hole extension member;

a putty cup means mechanically coupled to said elongate body member at its lower end for obtaining a core impression in the bore hole;

pendulum means positioned within said elongate body member for movement to a stable orientation in the bore hole corresponding to the orientation of the core whose impression is to be taken;

marking means mechanically coupled to said pendulum means for movement in response to movement of said pendulum means, said pendulum means and marking means being mounted within said elongated body member for movement relative thereto; and

mark receiving means arranged within said elongate body member in a fixed orientation relative to putty cup means for receiving a mark from said marking means after said pendulum means has assumed a stable orientation.

4,311,202

ELECTRICAL BALANCE INCLUDING A TRANSVERSELY ARRANGED LOAD COMPENSATION COIL

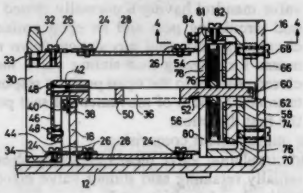
Peter Kunz, Gossau, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland

Filed Apr. 17, 1980, Ser. No. 141,148

Claims priority, application Switzerland, May 16, 1979, 4543/79

Int. Cl.³ G01G *7/00, 23/48*

U.S. Cl. 177—212 **10 Claims**



1. In an electromagnetic load-compensated weighing apparatus of the type including a housing (**10**), permanent magnet means (**74**) defining a magnetic field in said housing, a balance beam (**36**) mounted in said housing for pivotal movement about a horizontal pivot axis, and load compensation means including position sensing means (**62, 64**) connected with the housing for detecting displacement of the balance beam from an initial no-load position, and a compensation coil (**54**) connected with said beam and arranged for displacement in the magnetic field, thereby to cause the current flowing in the coil to react with the magnetic field of said permanent magnet means for producing on the balance beam a restoring force that compensates for a load applied to the balance; the improvement

(a) wherein the permanent magnet means is magnetized horizontally in a direction normal to said beam pivot axis; and

(b) further wherein the compensation coil (**54**) is flat and is contained in a plane normal to the longitudinal axis of said balance beam.

4,311,203

AGRICULTURAL TRACTORS AND OTHER VEHICLES

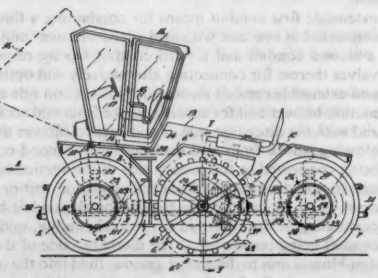
Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Continuation of Ser. No. 816,254, Jul. 15, 1977, abandoned, which is a division of Ser. No. 588,156, Jun. 19, 1975, abandoned. This application Jan. 19, 1979, Ser. No. 4,877

Claims priority, application Netherlands, Jun. 25, 1974, 7408500

Int. Cl.³ B62D *61/10*

U.S. Cl. 180—24 **18 Claims**



1. An agricultural tractor which comprises: a frame comprising forward and aft frame portions which are turnable relative

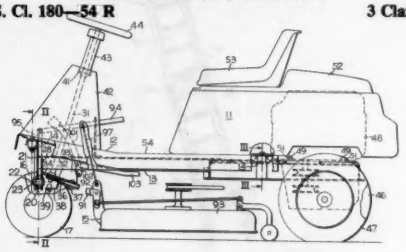
to each other about a fore and aft axis; power producing means supported by said frame; at least three pairs of ground wheels of substantially the same diameter mounted on said frame whereby a forward pair of said wheels is located forwardly thereon, a rear pair of said wheels is located rearwardly thereon and a further pair of said wheels is located between said forward and said rear pairs of wheels, control means for the tractor's operator whereby each of said further pair of wheels is selectively and independently displaceable upwardly above ground level and downwardly at least to ground level relative to the other wheels, a lifting device for implements or the like mounted at the rear of said aft frame portion, said rear wheels including pneumatic tires and being mounted on said aft frame portion and said forward wheels also including pneumatic tires and being mounted on said forward frame portion, each said pair of wheels including separate means for rotating same; means for separately controlling the rotation of each said wheel; separate power transmission means connecting each said rotating means with said power producing means whereby each said pair of wheels is energized substantially independently of the other said pairs of wheels; steering means connected to the forward of said pairs of wheels whereby said forward wheels are steerable with respect to said rear pair of wheels; said wheels located between said forward and said rear pairs of wheels having a tread width greater than the tread width of said forward and rear wheels and having a dentated form as seen from the side.

4,311,204

MOTOR VEHICLE WITH RESILIENT CUSHIONS BETWEEN ITS BODY AND MAIN FRAME STRUCTURES

Paul T. Shupert, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 26, 1979, Ser. No. 106,682
Int. Cl.³ B62D *27/04;* A01D *35/00*
U.S. Cl. 180—54 R **3 Claims**



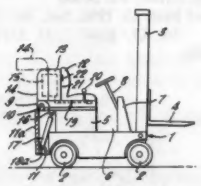
1. In a rear engine rider lawn mower vehicle the combination comprising:
a main frame structure including
a longitudinally and horizontally extending main frame and
a transversely and vertically extending front wall rigidly secured to the front of said main frame,
a transverse axle pivotally connected to said front wall for oscillating movement about a longitudinal axis,
a pair of laterally spaced steerable wheels connected in supporting relation to laterally opposite ends of said axle,
a pair of laterally spaced drive wheels in supporting relation to the rear end of said main frame,
an upwardly extending steering shaft rotatably supported on the front end of the main frame having a manually operated steering wheel nonrotatably secured to its upper end,
an engine mounted on the rear of said main frame,
a body structure in overlying relation to said main frame structure,
sleeve means on the front of said body structure slidably supporting said steering shaft to permit vertical movement of said body structure relative to said steering shaft,
an operator's seat on said body structure forwardly of said engine and rear wheels,
a first pair of laterally spaced cushion mounts between the front part of said body structure and the upper end of said front wall and
a second pair of laterally spaced cushion mounts between the rear part of said main frame and the rear part of said body structure approximately vertically beneath said seat,
each of said mounts including
an upright cylindrical cushion of resilient rubber-like material of predetermined outer diameter and vertical dimension,
upper and lower horizontal plates bonded, respectively, to the top and bottom surfaces of said cushion and secured, respectively, to said body and main frame structures and
means for resisting lateral sway of said body structure and limiting radial expansion of said cushion including a restrainer mounted on said body structure and presenting wall means in horizontally confronting relation to the radially outward facing cylindrical surface of said cushion, said wall means extending vertically alongside a substantial portion of the height of said cushion and contacting the latter to resist lateral shifting movement of said body structure relative to said main frame structure and to limit radial expansion of said cushion when the latter is subjected to predetermined vertical loading.

4,311,205

INDUSTRIAL TRUCKS AND BATTERY COVERS FOR THEM

Ronald Goodacre, and Ronald W. Piper, both of Basingstoke, England, assignors to Lansing Bagnall Limited, Hampshire, England

Filed Feb. 20, 1980, Ser. No. 123,772
Claims priority, application United Kingdom, Feb. 21, 1979, 06210/79
Int. Cl.³ B62D *25/00*
U.S. Cl. 180—68.5 **1 Claim**

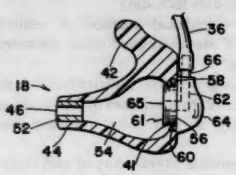


1. In an industrial battery-powered truck which includes a chassis on which is mounted a container for an electric storage battery which provides power for operating the truck, the improvement which comprises the combination of:
(i) a hinged lid for said container, said lid having open and closed positions;
(ii) a driver's seat disposed on said lid;
(iii) an openable compartment disposed on said lid behind the said seat;
(iv) electrical control gear for said truck, said electrical control gear being disposed within said openable compartment; and
(v) an axially extensible strut, which is connected between the lid and the chassis and which comprises means for urging said lid towards the open position thereof.

4,311,206
HEARING AID EAR MOLD WITH IMPROVED DISCRIMINATION

Rubein V. Johnson, 2432 Court, Muskogee, Okla. 74401

Continuation of Ser. No. 905,726, May 15, 1978, abandoned.
This application Oct. 4, 1979, Ser. No. 81,669
Int. Cl.[3] H04R 25/02
U.S. Cl. 181—135 1 Claim

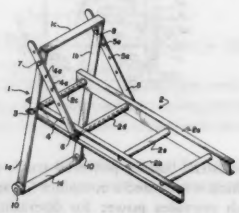


1. An improved ear mold for a hearing aid, comprising;
a plastic ear mold of selected outer shape and volume, said volume having a large diameter portion being the inlet end, and a neck portion adapted to fit into the ear of the user, being the outlet end;
said ear mold comprising an outer shell having an inner chamber utilizing a substantial major portion of the volume of said ear mold, a first opening in the inlet of said shell, and a second opening in the outlet end or neck portion of said shell;
tubular means to connect said first opening to an earphone, said second opening having a selected uniform inner diameter and selected length, whereby the volume of said inner chamber and the length and uniform inner diameter of said second opening comprise a resonating chamber of selected frequency; and
a tubular insert of a selected metal inserted into said second opening in said neck portion, communicating with said inner chamber, the internal opening of said insert being of selected length and selected uniform diameter.

4,311,207
LADDER ATTACHMENT

Percell C. Lurry, Aylett, Va. 23009

Filed Mar. 13, 1980, Ser. No. 130,157
Int. Cl.[3] E06C 7/48, 1/36
U.S. Cl. 182—206 4 Claims



1. A ladder attachment comprising a rigid rectangular frame having a pair of spaced, parallel side frame members and a pair of transversely extending end frame members connected to said side frame members at the ends thereof, a first bolt assembly extending transversely through the side frame members substantially intermediate the ends thereof and through the side rails of a ladder at one end thereof, whereby the rectangular frame is freely pivoted to the end of the ladder, a pair of links, a second bolt assembly extending transversely through one end of each link and the side rails of the ladder to thereby pivotally connect the links to said ladder side rails, a plurality of longitudinally spaced apertures provided in each of said links, an aperture provided in each of said side frame members of said rectangular frame adapted to be aligned with a respective selected aperture in said links, a third bolt assembly insertable through a selected aperture in the links and through an aligned aperture in the side frame members of said rectangular frame to thereby hold the frame member at an angular position relative to the ladder, said angular position being changeable by merely removing said third bolt assembly from a selected aperture in said links and inserting said third bolt assembly through another selected aperture in said links and through said aligned apertures in said side frame members, whereby the rectangular frame cooperates with the ladder to form a hook portion adapted to extend over the ridge of a pitched roof while the ladder is supported at an inclined position on the roof.

4,311,208
LADDER SAFETY LAMP

Patrick L. Macrorie, 508 N. Ward St., La Habra, Calif. 90631; Ronald C. Rohrenbacher, 824 Tamar Dr., La Puente, Calif. 91746, and Stephen B. Austin, 11462 Havenwood Dr., Whittier, Calif. 90606

Filed Jul. 18, 1980, Ser. No. 170,032
Int. Cl.[3] E06C 5/44, 5/34
U.S. Cl. 182—18 8 Claims

1. A warning signal assembly for use on ladders having a plurality of rungs to indicate the presence of someone on the ladder, said warning signal assembly comprising:
switch means activated by a person's foot placed on one of the lower rungs, said switch means activating signal means, said signal means being deactivated by a person's foot placed on one of said lower rungs.

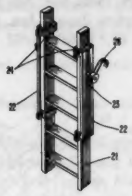
4,311,209
STEPLADDERS

Eugenio Primerano, and Rita Pieri in Primerano, both of Via Ettore Franceschini, 109 Roma, Italy

Filed Jan. 29, 1979, Ser. No. 7,600
Claims priority, application Italy, Feb. 6, 1978, 47927 A/78; Jan. 17, 1979, 47675 A/79
Int. Cl.[3] E06C 1/36
U.S. Cl. 182—206 18 Claims

1. In a ladder having steps and having primary stanchions for supporting said steps, the improvement comprising:
(a) at least one hook adapted to engage a supporting structure;
(b) means for mounting said hook to said ladder to permit selective sliding of said hook longitudinally along said

ladder beyond the intersection of at least one of said steps and a primary stanchions, wherein said means for mounting further permits rotation of said hook around an axis parallel to the longitudinal axis of said ladder; and



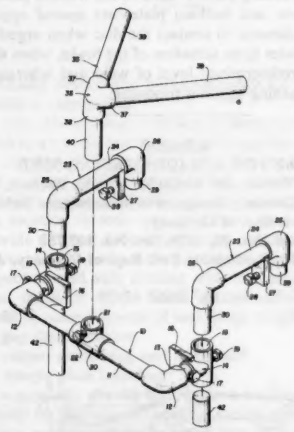
(c) means for selectively locking said hook in more than one longitudinal position along said ladder.

4,311,210

MULTI-PURPOSE LADDER ATTACHMENT

Jacob J. Jackson, 177 Main St., Tonawanda, N.Y. 14150

Filed Oct. 9, 1980, Ser. No. 195,494
Int. Cl.[3] E06C 7/44, 7/48
U.S. Cl. 182—214 6 Claims



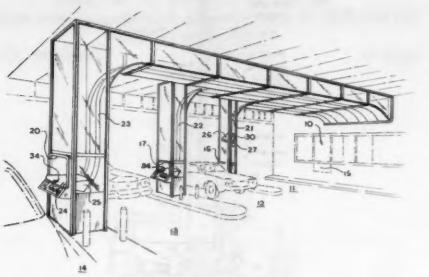
1. A multi-purpose ladder attachment comprising a basic mounting unit including a cross member spanning a ladder transversely during use and having means for clamping said unit to the opposite side rails of a ladder, said unit having a pair of upright axis sleeves near its opposite sides and an upright axis sleeve near its center, said sleeves having adjustable locking elements thereon, a pair of arm assemblies engageable in said pair of upright axis sleeves and being rotatable therein and lockable by said locking elements, ladder side rail extension members engageable adjustably in said side upright axis sleeves and being lockable therein by said locking elements, and an attachment for engaging a roof or pole including a depending member engageable and lockable in said upright sleeve near the center of said unit.

4,311,211

SERVICE SYSTEM

Fred W. Benjamin, Oakland, and Paul M. Leah, Prospect Park, both of N.J., assignors to American Standard Inc., New York, N.Y.

Filed Aug. 10, 1979, Ser. No. 65,709
Int. Cl.[3] B60M 7/00
U.S. Cl. 186—53 2 Claims



1. A packaged foodstuffs delivery system for transferring a tray between a teller position and at least one delivery station comprising at least three electrically conductive rails for conveying the foodstuffs, a carriage electrically coupled to said rails, an electrically dynamically braked motor within said carriage for driving said carriage, means for gimballing the tray to said carriage for transporting the foodstuffs therewith between the teller position and the delivery station, circuit means for propelling said carriage in either direction along said rails, at least one of said rails having an isolation section for causing said electrically dynamically braked motor to coast to a stop in order to enable said carriage and said gimballed tray also to stop in a manner that retains the foodstuffs on the tray, contacts for reversing the electrical polarity on said rails in order to reverse said carriage direction between the teller position and the delivery station, and delay means for causing said carriage to coast to a stop before reversing said carriage direction in order to enable said carriage and said gimballed tray to stop in a manner that retains the foodstuffs on the tray.

4,311,212

VALVE CONTROL SYSTEM

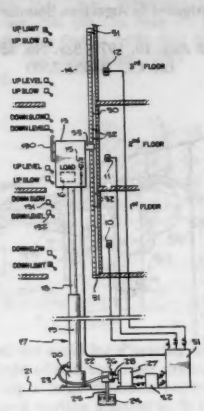
Elmer J. Simpson, Margate, Fla., assignor to Elevator Equipment Co., Los Angeles, Calif.

Filed Jul. 9, 1980, Ser. No. 167,388
Int. Cl.[3] B66B 1/04
U.S. Cl. 187—29 A 17 Claims

1. A system for actuating a hydraulic elevator wherein there is a cab responsive to a hydraulic ram to which hydraulic fluid is supplied by a pump and control valve motivated in turn by a motor and its amplifier component for moving said cab between a plurality of floors, said system comprising an electric power source, a main electric circuit for cab travel, and a balance bridge circuit responsive to the main circuit for control of hydraulic fluid fed to the ram whereby to effect cab travel, said balance bridge circuit comprising a first section in communication with the amplifier and motor for driving the motor and valve to adjustments passing fluid in a first direction for moving said cab from floor to floor, and a second section in communication with the amplifier and motor for driving the motor and valve to adjustments passing fluid in a second direction for potential reverse movement of said cab,

a speed control circuit in operative association with said balance bridge circuit and including setting means for establishing said speed control circuit at selected speeds, and a speed monitoring circuit in operative association with said balance bridge circuit adapted to constantly

correct deviations in said balance bridge circuit from said selected speed,



said speed monitoring circuit having a component therein electrically responsive to the rate of travel of said cab at all positions and rates of travel of said cab.

4,311,213

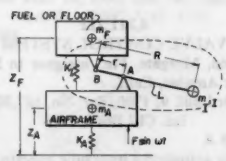
VIBRATION ISOLATION SYSTEM

Rene A. Desjardins, Media, and Vladimir Sankewitsch, West Chester, both of Pa., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 5, 1979, Ser. No. 72,748

Int. Cl.³ F16F *7/10*

U.S. Cl. 188—380 **10 Claims**



9. A nodal isolator for decoupling a vibrating mass from the influence of variations in the mass of a body of varying mass, such that the force feedback from the body to the vibrating mass, due to the variations in the mass of the body, is eliminated, said isolator comprising:

a weighted lever arm pivotally connected at its end remote from its weighted portion to both the body of varying mass and the vibrating mass; and

a spring connected to both the body of varying mass and the vibrating mass, such that the connections of the weighted lever arm lie in one plane and the connections of the spring lie in another plane, both planes being substantially parallel, resulting in the body of varying mass, the vibrating mass, the weighted lever arm, between its two connections, and the spring forming a four-bar linkage which produces a reaction to all in-plane forces and moments applied to the isolator.

4,311,214

DISC BRAKE

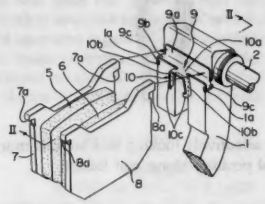
Tetsuo Haraikawa, Funabashi, and Koichi Tamura, Tokyo, both of Japan, assignors to Tokico Ltd., Japan

Filed Jan. 18, 1980, Ser. No. 113,270

Claims priority, application Japan, Jan. 19, 1979, 54-5683

Int. Cl.³ F16D *66/02*

U.S. Cl. 188—1.11 **7 Claims**



1. A disc brake comprising:

a stationary member secured to a non-rotatable part of a vehicle,

a pair of friction pads disposed on opposite sides of a rotatable disc,

backing plates on which said pads are mounted, portions of said backing plates being in spaced opposed relationship on opposite sides of said disc,

a guide plate interposed between said stationary member and said friction pads for slidably guiding the friction pads in the direction of the rotational axis of the disc upon actuating the brake,

a pair of wear warning members, each of which being integral with said guide plate and extending between said disc and each backing plate of each of the friction pads, in the space where said backing plates are spaced opposed, a sufficient distance to contact the disc when urged by the backing plates upon actuation of the brake, when the pads reach a predetermined level of wear and whereupon an audible warning signal is produced.

4,311,215

BRAKE FOR A SLIDE COASTER SLED

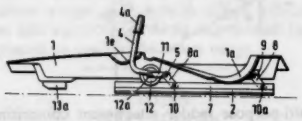
Klaus Becker, Wetter, and Karlheinz Wolski, Bochum, both of Fed. Rep. of Germany, assignors to Mannesmann DeMag AG, Duisburg, Fed. Rep. of Germany

Filed Dec. 20, 1979, Ser. No. 105,755

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1979, 2901755

Int. Cl.³ B62B *17/08*

U.S. Cl. 188—8 **10 Claims**



1. A slide coaster sled which comprises:

(a) an elongated sled body,

(b) a seat on said body,

(c) sled braking surfaces disposed on the bottom of said sled body,

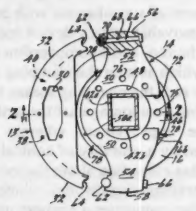
(d) said sled braking surfaces being elongated to extend along said body,

(e) the length of said braking surfaces along the longitudinal axis of said sled being several times greater than the width of said braking surfaces,

(f) said braking surfaces extending continuously in the longitudinal direction,

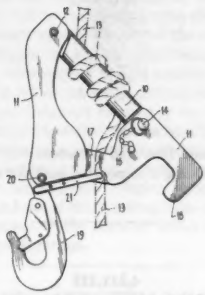
(g) said braking surfaces being comprised of a supple elastic material,
(h) said braking surfaces including two spaced apart longitudinally extending braking surfaces equilaterally spaced from the longitudinal center line of said body,
(i) a front cross bar connecting said two braking surfaces together,
(j) a rear cross bar connecting said two braking surfaces together,
(k) a brake lever extending from said front cross bar to the top of said body,
(l) an elongated braking surface support bracket mounted on said sled body for engaging said braking surfaces, and
(m) longitudinal groove means disposed in said braking surfaces and extending the length thereof generally parallel to the longitudinal axis of said braking surfaces.

4,311,216
TORQUE PLATE FOR DISC BRAKE
Wayne H. Garrett, Troy, and Ted Zbikowski, Southfield, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio
Filed Oct. 5, 1979, Ser. No. 82,357
Int. Cl.[3] F16D *65/02*
U.S. Cl. 188—18 A **3 Claims**



1. A sliding caliper disc brake assembly for a heavy duty motor vehicle comprising:
(A) a rear axle housing including a tubular inboard housing portion, a tubular outboard housing portion, and an annular radially extending flange adjacent to the interface of said portions and having a generally circular outer diameter; said inboard axle housing portion being necked down at a location thereon spaced inboard from said flange to provide a reduced dimension cross section;
(B) a vented disc brake rotor positioned concentrically with respect to said axle housing with the generally circular inner diameter of the rotor spaced radially outwardly from the outer diameter of said flange to provide an annular gap therebetween;
(C) a caliper embracing said rotor; and
(D) a torque plate including:
(1) a generally annular base portion positioned concentrically on said inboard housing section with its outboard face secured to the inboard face of said flange and having a generally circular outer diameter approximating that of said flange;
(2) means defining a cutout in said base portion having a dimension approximating said reduced dimension so that the torque plate may be slipped over said inboard axle housing portion at said reduced dimension cross section and then slid axially outboard to its installed position seated against the inboard face of said flange;
(3) arm portions extending radially outwardly from said base portion at circumferentially spaced locations thereon and across said gap to a location radially beyond the outer diameter of said rotor, and
(4) mounting portions extending axially outboard from the radially outer ends of said arm portions and over said rotor to provide mounting and guide means for said caliper and to allow the caliper to slide on the torque plate as the brake is applied.

4,311,217
DESCENT CONTROL UNIT
Kenneth H. Wood, Brighton, Australia, assignor to Moxham Industrial Pty., Ltd., South Melbourne, Australia
Filed Dec. 21, 1979, Ser. No. 106,164
Claims priority, application Australia, Dec. 29, 1978, PD7237
Int. Cl.[3] B65H *59/16*
U.S. Cl. 188—65.2 **3 Claims**



1. A descent control unit including a friction bar around which a rope may be wound, gate means hinged to one end of said bar and adapted to releasably close onto the other end of said bar so as to co-operate therewith to provide an enclosed loop, locking means associated with said bar and said gate means to lock said bar and gate means in the closed condition, said gate means providing a groove adapted, in use, to receive said rope for the purpose of guiding downwardly extending free rope from said unit and facilitating control of descent rate, and hook means pivotally connected to said gate means and adapted to attach said unit to a support on a person to be lowered, said hook means having an arm member thereon and being located in a position such that, in use, under the weight of said person said hook means assumes a position wherein said arm member bridges said groove to prevent the rope from becoming removed.

4,311,218
BRAKING DEVICE FOR USE WITH CLIMBING LINES
Lisle J. Steffen, 11920 SW. 158th, Portland, Oreg. 97236
Continuation-in-part of Ser. No. 16,413, Mar. 1, 1979, abandoned. This application Mar. 3, 1980, Ser. No. 126,578
Int. Cl.[3] B65H *59/14*; A62B *1/16*
U.S. Cl. 188—65.4 **6 Claims**

1. A braking device for frictionally controlling passage of a flexible line therethrough during mountain climbing and rescue operations, comprising:
(a) an elongate link having a pair of generally parallel apart-spaced longitudinal members and a pair of opposite end portions interconnecting said longitudinal members;
(b) a plurality of apart-spaced crossbars, each of said plurality of crossbars extending between said longitudinal members at locations spaced apart from said opposite end portions, each of said plurality of crossbars extending across said longitudinal members on a first side of said elongate link; and
(c) at least one elongate brake bar pivotably attached at a first end thereof to a first one of said pair of longitudinal members and extending across said longitudinal members in a location between adjacent ones of said crossbars, a second end of said at least one elongate brake bar resting

against a second one of said pair of longitudinal members on a second side of said link when said braking device is

installed on said line, said crossbars and said at least one brake bar defining a serpentine path for said line.

4,311,219

CALIPER GUIDING MECHANISM FOR DISC BRAKE

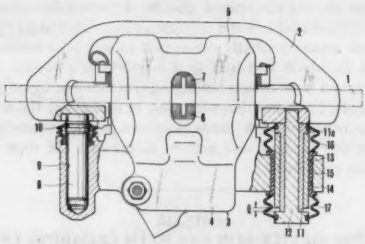
Yushiyo Watanabe, Kuki; Toshihiko Kimura, Iwatsuki, and Masayuki Kurata, Kuki, all of Japan, assignors to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1979, Ser. No. 92,844

Claims priority, application Japan, Nov. 16, 1978, 53-141679; Nov. 17, 1978, 53-141884; Nov. 17, 1978, 53-141885

Int. Cl.³ F16D *55/02*

U.S. Cl. 188—71.8 **19 Claims**



1. In caliper guiding mechanisms employed to a disc brake having a caliper member which is arranged to push friction pads against a disc and is arranged to be guided by a support member in the axial direction of said disc and slide pins each of which is placed in an opening provided in one of said two members and is secured to the other member, at least one of said caliper guiding mechanisms characterized in that:

between said opening and said slide pin, there are provided a rigid sleeve and an annular elastic body which have their outer and inner circumferences arranged to be in fitted engagement with each other; and there are formed a first sliding part which is not included in said elastic body and which has a first sliding resistance and a second sliding part which is included in said elastic body and has a second sliding resistance which is greater than said first sliding resistance, said second sliding part being movable in two opposed directions relative to said rigid sleeve, with the amount of movement of said caliper member by the action of said first sliding part being restricted to a predetermined extent.

4,311,220

SAFETY CATCH FOR ELEVATORS, LIFTING PLATFORMS, AND THE LIKE

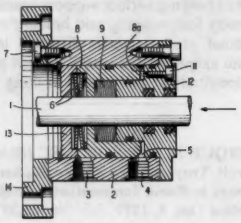
Ruprecht Maurer, Bad Homburg, Fed. Rep. of Germany, assignor to Ringspann Albrecht Maurer K.G., Bad Homburg, Fed. Rep. of Germany

Filed Oct. 18, 1979, Ser. No. 86,142

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1978, 2845266

Int. Cl.³ F16D *59/02*

U.S. Cl. 188—170 **21 Claims**



1. In a safety catch device for blocking movement of a rod relative to a component of a mechanism with respect to which the rod is normally movable, which device includes clamping means surrounding the rod, and a compression spring disposed to produce a force which acts on the clamping means to clamp the latter against the rod, the clamping means being releasable from the rod clamping position against the action of the compression spring, the improvement wherein said clamping means are constituted by a plurality of conical clamping discs combined into a packet extending along the axis of the rod and provided with a central opening through which the rod passes, and said device further comprises a support member which is substantially stationary relative to the mechanism component and axially supports said clamping means at one end thereof, and an axially movable member axially supporting said clamping means at the other end thereof and disposed for transmitting the force produced by said spring to said clamping means in the axial direction of the rod for at least partially flattening said discs for producing a radial clamping force between said discs and the rod.

4,311,221

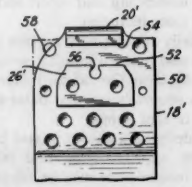
BRAKE BAND END CONNECTION

Michael Ratner, 67-33 170th St., Flushing, N.Y. 11365

Filed Sep. 26, 1979, Ser. No. 79,088

Int. Cl.³ F16D *65/06*

U.S. Cl. 188—259 **7 Claims**



6. A link member for use in assembly of a brake band in a transmission which has had one end thereof modified to permit insertion of said modified brake band end in a transmission housing between the housing and a brake drum therein without requiring complete disassembly of the housing comprising, a curved plate member having a radius of curvature substantially equal to the radius of a brake drum on which said brake band

is to be used, said curved plate member including a cutout segment along the midportion thereof, an extending tang formed along one surface defining said cutout segment, said tang being formed to extend upwardly from the outside curved surface of said plate member and then generally more inwardly to define a pocket to receive an element of a reciprocating force applying member and said link member including a cutout defined by opposed shoulder segments formed in an end surface of said plate member adjacent said tang to locate and position said link member on a brake band end plate.

4,311,222

SUITCASE WITH ROLLERS

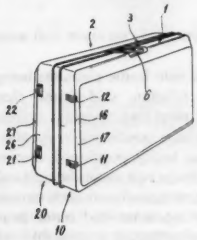
Philippe Castanier, Geneuille, France, assignor to Superior, S.A., France

Filed Jan. 25, 1980, Ser. No. 193,270

Claims priority, application France, May 26, 1978, 78 16941

Int. Cl.³ A45C *5/14*

U.S. Cl. 190—18 A **7 Claims**



1. A suitcase comprising a shell having a plurality of roller-receiving sockets, and rollers removably held in said sockets, each of said rollers being rotatable on an axis extending between opposite side walls of a box fitting into a said socket and having a periphery comprising said side walls, and flexible tongues provided on side walls of said box and having bevelled beads at their free ends, said socket having openings to receive and retain said beads to retain said box with its roller in said socket, said box being releasable from said socket by lateral flexing of said tongues to displace said bevelled beads to free them from said openings.

4,311,223

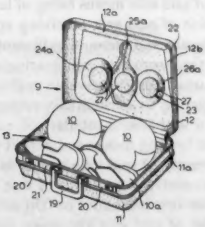
BOWLING BAG

Edward B. Stein, Chicago, Ill., assignor to Stebco Industries, Inc., Chicago, Ill.

Filed Mar. 19, 1980, Ser. No. 131,842

Int. Cl.³ A63B *47/00*

U.S. Cl. 190—51 **19 Claims**



1. A bowling bag for one or two bowling balls, as desired, including a pair of hard shell similarly shaped bag sections each of a generally cup-shaped configuration having open sides mounted in confronting relation defining a cavity for receiving a bowling ball or balls, hinge means joining said bag sections in assembly together along respective lower edges of said sections, handle means cooperable with said sections for transporting the same, latch means joining said bag sections along upper margins of said bag sections, ball mounting means for securely positioning one or two bowling balls inside said cavity defined by said sections, said ball mounting means comprising three sets of longitudinally contiguous sockets supported by opposed walls of said sections, the sets of contiguous sockets on said bag sections positioned vertically above said lower edges a sufficient distance for enabling opposite sides of a bowling ball to be positioned within anyone of said three sets of longitudinally spaced sockets to inhibit movement of the ball when so engaged while the bag sections are in a closed position relative to one another, and with the sockets so located to enable the ball to be engaged upon the lower edges of the bag sections when mounted inside of the cavity defined by the closed bag sections, the handle means being positioned in a centered position with respect to said sockets so that the load of the bowling ball when carried in a centermost of said sockets can be uniformly balanced relative to the handle means to facilitate ready transport of the ball, the handle means being so positioned with respect to opposite endmost of the longitudinally contiguous sockets enabling bowling balls to be carried and supported in side-by-side relation within the endmost sockets so that the load of the bowling balls can be uniformly balanced with respect to the sections when the bag is transported by said handle means.

4,311,224

TORQUE LIMITER

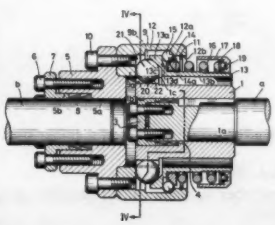
Heizaburo Kato; Yoshio Ogawa, and Masao Nishioka, all of Tokyo, Japan, assignors to Kabushiki Kaisha Sankyo Seisakujo, Tokyo, Japan

Filed Aug. 3, 1979, Ser. No. 63,646

Claims priority, application Japan, Aug. 24, 1978, 53-102361; Feb. 9, 1979, 54-13295

Int. Cl.³ F16D *7/02, 43/20*

U.S. Cl. 192—56 R **4 Claims**



1. An elastic pressure device for torque-transmitting balls in a torque limiter of a construction such that a plurality of axially extending arcuate recesses are formed on the outer periphery of an interlocking ferrule fitted over a rotatable driving member; a coupling member having a plurality of radially extending grooves formed on the inner periphery thereof and matched with said arcuate recesses of said interlocking ferrule on said rotatable driving member; said coupling member being connected to an interlocking ferrule fitted over a driven member opposed to said driving member, each of said radial grooves having a torque-transmitting ball fitted therein so as to only move radially and rotate about its own axis while it is confined in motion in the revolving and axial directions, said torque-transmitting balls being biased diametrically inwardly by an elastic pressure means, which comprises a compression spring, a pressure nut, a first taper thrust ring, a group of small thrust balls, and a second taper thrust ring, so that the torque is transmitted from said rotatable driving member to said driven member and the two members are integrally driven together, said coupling cylinder being fastened by clamping bolts to said interlocking ferrule fitted over said driven member; said

torque-transmitting balls being pressed against an inclined edge of said second taper thrust ring fitted in a cylindrical skirt of said coupling cylinder by said elastic pressure means, with a pressure exerted as said first taper thrust ring and said group of small thrust balls being pressed against an inclined edge on the inside of said second taper thrust ring by said compression spring under the urging of a pressure nut threadedly engaged with the outside of an inner sleeve portion of said coupling cylinder.

4,311,225

DEVICE FOR DRIVING DRIVEN MEMBER BY ROLLER CHAIN

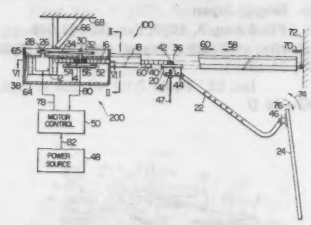
Toshio Tsubaki; Takeshi Tokunaga; Seiji Yonekura; Shigeru Matsuoka; Makoto Miura, and Kozi Yamauchi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 12, 1979, Ser. No. 47,798

Claims priority, application Japan, Jun. 14, 1978, 53-72502; Jun. 14, 1978, 53-72503; Jun. 14, 1978, 53-72504; Jun. 14, 1978, 53-72506; Jun. 14, 1978, 53-72507; Jun. 14, 1978, 53-72508; Jun. 14, 1978, 53-72509

Int. Cl.³ F16D *7/02, 71/00;* **E05F** *15/14*

U.S. Cl. 192—142 R **18 Claims**



17. A device for driving a driven member by a roller chain comprising:

a roller chain having a free end;

a driven member automatically releasably coupled to said roller chain;

guide means for guiding and supporting said roller chain together with said driven member;

drive means for driving said roller chain so as to cause reciprocating movement of said roller chain along said guide means;

control means for controlling the operation of said driven member; and

obstruction detecting means for detecting the presence of an obstruction obstructing the smooth travelling movement of said driven member, said detecting means detecting the presence of such an obstruction in response to a physical force acting upon said roller chain while movement of said driven member is prevented by said obstruction, including a stationary member having a curved face, a movable member disposed opposite to said stationary member and having a curved face defining, together with the curved face of said stationary member, a curved path permitting passage of said roller chain therethrough, and a detector actuated in response to the impartation of a physical force to said movable member from the portion of said roller chain passing through said curved path.

4,311,226

TRAPPED-AXLE CONVEYOR ROLL

Glen L. Thompson, Newman Lake, and Joe W. Way, Jr., Spokane, both of Wash., assignors to Gifford-Hill & Company, Inc., Spokane, Wash.

Filed Jan. 28, 1980, Ser. No. 117,220

Int. Cl.³ B65G *39/02*

U.S. Cl. 193—35 R **3 Claims**

1. A conveyor frame and conveyor roll assembly comprising:

a pair of elongated side frame elements being positioned in parallel spaced relation, said frame elements defining noncircular axle receiving openings defining at least two opposed flat surfaces positioned in parallel relation;

tubular roll means being positioned between said frame elements, said tubular roll means being a cylindrical sleeve defining bearing receptacles at each extremity thereof;

bearing means having inner and outer bearing races and bearing means establishing a rotatable relation therebetween, said outer bearing races being received in press fitted nonrotatable relation within said bearing receptacles, said inner bearing races defining hexagonal axle receiving aperture means;

tubular conveyor roll axle means being positioned within said tubular roll means and defining an intermediate tubular portion of generally cylindrical configuration and first and second hexagonal tubular extremities formed at the respective ends of said intermediate tubular portion, said hexagonal tubular extremities being receivable in linearly movable and nonrotatable mating relation within said noncircular axle receiving aperture means of said inner bearing races, said first tubular extremity of said conveyor roll axle means being of greater length than said second tubular extremity thereof, said first and second extremities being receivable in nonrotatable mating relation within said noncircular axle receiving openings of said frame elements, said second extremity of said conveyor roll axle means defining stop aperture means which, in the operative position of said conveyor roll axle means relative to said frame elements, is located between one of said frame elements and one of said bearing means, said intermediate tubular portion of said axle means being of larger diameter than the dimension of said axle receiving aperture means of said bearing means and being of sufficiently less length as compared to the spacing of said bearing means to render said axle means linearly movable within said tubular roll means sufficiently to substantially retract said second extremity thereof within said tubular roll means and said inner race of said bearing means and permit positioning of said second extremity of said axle means in registry with one of said axle receiving openings of one of said frame elements with said first extremity of said axle means positioned within one of said axle receiving openings of the opposite one of said frame elements; and

stop pin means being receivable within said stop aperture means and, in said operative position, restricting linear movement of said axle means relative to said one of said frame elements and said bearing means.

4,311,227

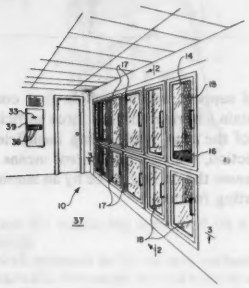
VENDING SYSTEM FOR FLORAL TYPE PRODUCTS

Kenneth M. Watkins, 3301 Starmount Dr., Raleigh, N.C. 27604

Continuation of Ser. No. 858,091, Dec. 8, 1977, abandoned. This application Feb. 7, 1980, Ser. No. 119,402

Int. Cl.³ G07F 7/04

U.S. Cl. 194—4 C 6 Claims



1. A product type vending system operable by a customer, comprising: a plurality of enclosed cubicles capable of containing a product; an access door operatively associated with each of said cubicles and movable between an open and a closed position for respectively permitting and denying outside access to said associated cubicle; a controllable locking means operatively associated with each of said doors for preventing, when in a locking condition, the corresponding door from being opened and for permitting, when in an unlocking condition, the corresponding door to be opened; a validator means for accepting and totaling money placed therein by the customer; a plurality of selector means individual to each locking means accessible to the customer and operatively connected between said validator means and each of said locking means for actuating said locking means when operated and thereby unlocking the corresponding door; and a plurality of variably adjustable control means individual to said selector means and unaccessible to the customer, said control means operatively connected to said selector means for permitting the operation thereof based on an adjustment of said control means corresponding to the desired amount of money to purchase the product contained in the corresponding one of said cubicles, whereby when the predetermined amount of money is paid into the validator and a selector means is operated, the associated locking means thereof will operatively release the associated door so that the product within the selected cubicle can be removed; said validator, said selector means, and said locking means being electrically operated; and said locking means comprising a solenoid and solenoid mounting means which, when said solenoid is energized, vibrates so as to produce an audible sound to indicate to the customer which door is to be opened.

4,311,228

AUTOMATIC FEEDER FOR EMPTY BAGS OR THE LIKE

Mario Moltrasio, Viale Vittorio Emanuele, 34, Bergamo, Italy

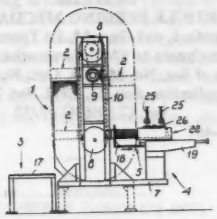
Filed Aug. 6, 1979, Ser. No. 64,285

Claims priority, application Italy, Jul. 28, 1978, 26250 A/78

Int. Cl.³ B65G 47/26

U.S. Cl. 198—422 7 Claims

1. An automatic feeder for empty bags or the like, characterized in that it comprises a carousel type accumulator having a plurality of containers, each of said containers being capable of containing bags either singularly or in stacks, said containers being conveyed by said carousel type accumulator along an annular path, at least one supplying station for the bags and at least one discharging station therefor both arranged in the said path, extraction mechanisms capable of detecting said containers when they are filled and act thereon in said discharging station for extracting the bags, as well as conveying means for transferring singularly the extracted bags towards a successive working station, wherein each said containers has a mouth for the introduction of said bags, an outside bottom on the opposite side in respect of said mouth, and an intermediate inner bottom provided between said outside bottom and said mouth,



arranged to limit the maximum introduction of the bags therein and in that two opposite walls of the lateral surface of each container and said inner bottom are provided with slits which define together passages extending throughout each container in accordance with its direction of movement on said carousel accumulator.

4,311,229

APPARATUS FOR HANDLING ROD-LIKE ARTICLES

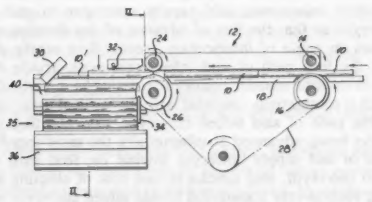
George Bennett, London, England, assignor to Molins Limited, London, England

Filed Sep. 8, 1976, Ser. No. 721,227

Claims priority, application United Kingdom, Sep. 18, 1975, 38344; Dec. 1, 1975, 49268

Int. Cl.³ B65G 47/26

U.S. Cl. 198—457 22 Claims



1. A device for receiving endwise-moving rod-like articles including means defining an axial first path for said articles, means for retarding axial movement of successive leading articles along a portion of of said first path, a stack forming region for receiving said articles from said retarding means, means including spaced surfaces defining a transverse second path for conveying said articles away from said region as a stream consisting of a multi-layer stack of articles moving transverse to their lengths, at least one of said surfaces consisting of movable conveyor means, channel means including a channel having a width about the same as the diameter of a rod-like article for guiding articles downwards from said first path towards said stack forming region, said stack forming region being positioned between said first path and said conveyor means so that articles delivered through said channel means may be received on top of a stack on said conveyor means, deflecting means for transversely deflecting each successive leading article from said first path through said channel into said stack forming region, including means for separately deflecting the trailing end of each article into said channel, sensor means arranged to monitor the level of articles in said stack forming region between said first and second paths, and means for controlling said conveyor means in response to signals derived from said sensor means so that said stack of

articles in said second path is maintained at a substantially predetermined constant height, wherein said retarding means includes an inclined surface at the end of said first path and means for directing an air jet from said inclined surface to deflect said rod-like article into said channel.

4,311,230

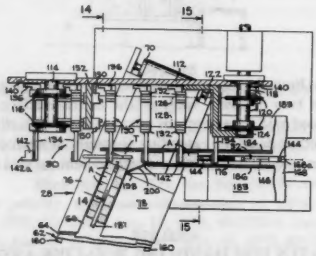
ARTICLE FEEDING MECHANISM

Donald C. Crawford, and Gary M. Le Tourneau, both of Green Bay, Wis., assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 955,671, Oct. 30, 1978, abandoned. This application Aug. 11, 1980, Ser. No. 176,942

Int. Cl.³ B65G *47/52*

U.S. Cl. 198—457 **14 Claims**



1. In an apparatus for feeding articles to a wrapping machine, said apparatus having an infeed conveyor mounting regularly spaced article feeding lugs, a supply conveyor for continually advancing an aligned longitudinal abutting row of articles along a linear path, laterally spaced guide means overlying the supply conveyor to retain the articles in a longitudinal row, and a transfer conveyor for directing successive leading articles from the abutting row of articles to the infeed conveyor, connecting said supply conveyor to said infeed conveyor so that the line of advance of the abutting articles defines an angle of intersection greater than ninety degrees with the feed path of said infeed conveyor, article feeding fingers on said transfer conveyor orbiting in a vertical plane which is substantially coplanar with the vertical plane containing the path of said infeed conveyor, said abutting row of articles being advanced at substantially the same speed as the speed of said supply conveyor toward the feed path of said infeed conveyor, said articles in said row of abutting articles being successively transferred to said infeed conveyor when a finger of said transfer conveyor engages an upstream portion of a rearwardly facing edge of the article of said abutting row of articles facing said finger as it passes beyond the guide means and, in combination with the concurrent movement of the article by the supply conveyor, a turning moment is produced disassociating the article from the abutting row of articles and propelling the article toward the infeed conveyor.

4,311,231

ACCUMULATING CONVEYOR

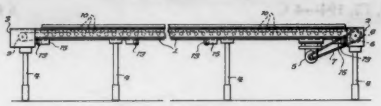
Carl J. Milazzo, Kenmore, N.Y., assignor to Hohl Machine & Conveyor Co., Inc., Buffalo, N.Y.

Continuation of Ser. No. 875,219, Feb. 6, 1978, abandoned. This application May 19, 1980, Ser. No. 150,879

Int. Cl.³ B65G *13/07*

U.S. Cl. 198—781 **5 Claims**

1. In an accumulating conveyor of the type having a supporting frame, a series of article carrying rollers journaled on said frame, endless drive means, and actuating rollers for engaging said drive means against said carrying rollers to impart a driving force thereto, the improvement which comprises pneumatically inflatable support means supporting said actuating rollers and means for inflating said support means and thereby imparting to said carrying rollers a controlled driving force including selectively adjustable control means operable to maintain a selected pneumatic pressure within said support means substantially no greater than that required to drive the load being conveyed with minimum holdback force during accumulation of the load on said conveyor, wherein said means



for inflating said support means include first control means operable to maintain a normal driving force sufficient to maintain movement of the load while being insufficient to overcome starting friction, and second control means operable to momentarily increase the driving force by an amount sufficient to overcome starting friction.

4,311,232

FETIMN ALLOY GRANULATE IN A PRESSURE CONTAINER FOR STORAGE OF HYDROGEN AND DEUTERIUM

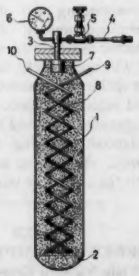
Karl-Heinz Klatt, and Helmut Wenzl, both of Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Sep. 11, 1979, Ser. No. 74,344

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1978, 2840265

Int. Cl.³ B01J *20/06;* F17C *6/00, 9/02, 11/00*

U.S. Cl. 206—0.7 **4 Claims**



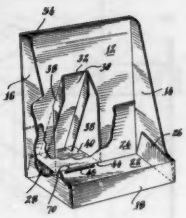
1. In a granulate-filled pressure chamber for storage of hydrogen, deuterium or both hydrogen and deuterium or for combining hydrogen and deuterium as HD, an iron-titanium-manganese alloy granulate filling for said chamber having the improvement which consists in that the granulate filling is activatable without externally supplied heat at ambient room temperature and has an oxygen content in atomic ratio of from 1:3 to 1:3.5 to the manganese content of the FeTiMn alloy and the titanium content is such that the atomic ratio of titanium not bound in metal oxides to unbound iron is not less than 1:1, while the FeTiMn alloy has a Fe-Ti content of 90 to 95% by weight.

4,311,233

EASEL DISPLAY PACKAGE

John J. Austin, Elkhart, Ind., assignor to Champion International Corporation, Stamford, Conn.

Filed May 23, 1980, Ser. No. 152,680
Int. Cl.³ B65D 25/24, 5/52
U.S. Cl. 206—45.25 12 Claims



1. A package for displaying a product on a supporting surface, comprising:

a bottom wall adapted to lie on said surface;

a pair of sidewalls connected to said bottom wall and extending upwardly therefrom;

a rear wall extending upwardly from said bottom wall and connected to each of said sidewalls of said pair thereof;

said bottom, rear and pair of sidewalls forming an enclosure for containing said products therein; and

support means for preventing said rear wall from being pivoted rearwardly onto said surface, said support means including a first portion comprising a support flap having one extremity thereof hingedly connected to said rear wall at a location thereon spaced above said bottom wall and extending rearwardly from said rear wall, said support means including a second portion comprising a connecting flap having one extremity thereof hingedly connected to the other extremity of said support flap and extending inwardly from said first portion toward said rear wall wherein

said rear wall includes a cut-out section therein between said bottom wall and said location thereon,

said package further includes a cover flap hingedly connected to said bottom wall and extending upwardly therefrom in overlapping relationship to said cut-out section, and

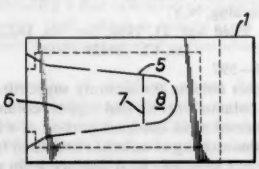
the other extremity of said connecting flap is releasably secured to said cover flap.

4,311,234

DISPLAY AND DISPENSING CONTAINERS

Charles R. Wildgoose, Richmond, England, assignor to The Gillette Company, Boston, Mass.

Filed Feb. 26, 1980, Ser. No. 124,883
Claims priority, application United Kingdom, Feb. 27, 1979, 6924/79
Int. Cl.³ A45C 11/26
U.S. Cl. 206—354 5 Claims



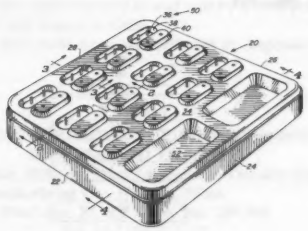
1. A display and dispensing container for wrapped razor blades, consisting of a backing card and blister of transparent material secured at its periphery to the card to define therewith a storage compartment in which a stack of wrapped blades is housed; wherein said card has a portion delineated by a line of weakness to permit ready detachment of the portion from the remainder of the card to form a finger opening through the card; wherein said blister is of rectangular form and has outwardly extending flanges secured along their lengths to the card at the two long edges of the blister and at one end edge, the opposite end edge being adjacent an edge of said card, but free of said card along at least a major portion of the length of said end edge, to form an exit slot at one end of the compartment for the dispensing of individual wrapped blades from the compartment; and wherein said exit slot has an initial length less than the width of the wrapped blades, said slot being increased in length by removal of said portion, whereby to permit dispensing of the wrapped blades ony after removal of said portion.

4,311,235

ORGANIZER JEWELRY BOX

Wanda L. Titus, Box 1212, Black Canyon Stage, Phoenix, Ariz. 85029

Filed Mar. 31, 1980, Ser. No. 135,682
Int. Cl.³ B65D 73/00, 1/34
U.S. Cl. 206—483 6 Claims



1. An organizer tray for the organized containment of jewelry items particularly pairs of earrings for pierced ears having a clasp and an ornamental portion, said tray comprising:

(a) a tray surface supported on and intersecting upstanding sidewalls at a peripheral edge; and

(b) an organizer section formed in said tray surface comprising:

(i) recess means defined in said surface, said recess having a bottom wall and a pair of projection means upwardly extending from said bottom wall adapted to receive said clasp portion of a pair of earrings;

(ii) land means formed in said tray adjacent said recess, said land having a surface defining a pair of apertures for receiving the ornamental portion of a pair of earrings.

4,311,236

PACKAGE PRODUCT AND METHOD

Dwight N. Johnson, San Marcos, Calif., assignor to JH Industries, Inc., San Marcos, Calif.

Filed Mar. 24, 1981, Ser. No. 247,064
Int. Cl.³ B65D 73/00
U.S. Cl. 206—488 13 Claims

1. A packaged valve product comprising:

a flat, planar card member;

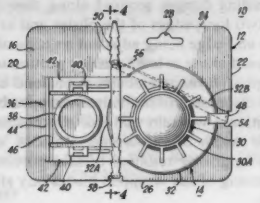
a flush valve including a valve structure and an elongated, flexible lift strap extending from said valve structure;

said valve structure including a main body portion surrounded by an outwardly projecting annular flange;

an aperture in said card larger than at least part of said main body portion and smaller than said flange;

said valve structure being positioned on said card with said main body portion extending through said aperture and

with said flange abutting the surface of said card surrounding said aperture;



said lift strap being wrapped around said card and valve structure; and

an end portion of said lift strap being secured to said card.

4,311,237

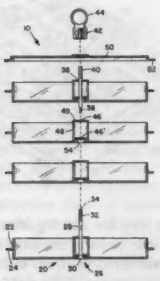
FOOD CARRYING AND DISPLAY CONTAINER SYSTEM

John C. Hayes, 8316 Lager La., Baltimore, Md. 21207

Filed Mar. 14, 1980, Ser. No. 130,384

Int. Cl.³ B65D *21/02, 6/24, 8/14*

U.S. Cl. 206—503 **4 Claims**



1. In an array formed of a plurality of containers held in vertically spaced relation by stacking means coaxial therewith and adjustable with respect thereto and a top for the uppermost container, the improvement comprising:

a rim around each container;

the stacking means including: said top and each container having a hole centrally therethrough,

a spacer on each container around the hole, coupling means passing through each said spacer and hole, each rim comprising a circular member on the container and safety pickup means on each container comprising a planar flange on the circular member radially protrusive from an intermediate portion thereof, a first cleaning provision comprising means detachably holding each rim, the means detachably holding including an upstanding flange fixed around the perimeter of each container and having protrusion for fitting said rim and further including means locking the rim to the upstanding flange, a second cleaning provision comprising means detachably holding each spacer, the means detachably holding each spacer comprising a tubular core fixed as part of each container, each spacer and tubular core having mutually engaging convolutions, the coupling means comprising means for sealing the rims of said containers and top including means for compressing together the rims of said containers and top, and means for preventing distortion of the containers on said compressing together, comprising said spacers having height proportioned for limiting said compression of the rims by sharing the load of said compression.

4,311,238

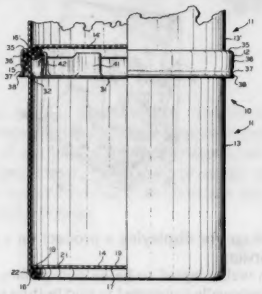
CLOSURE AND A PACKAGE EMPLOYING THE CLOSURE

Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 27, 1979, Ser. No. 107,794

Int. Cl.³ B65D *21/02, 41/18*

U.S. Cl. 206—508 **27 Claims**



1. A closure comprising:

a central diaphragm;

a first slanting wall circumferentially continuous with the central diaphragm and extending outwardly and upwardly therefrom;

an annular wall circumferentially continuous with an upper portion of the first slanting wall and extending generally upwardly therefrom;

an annular rim wall circumferentially continuous with an upper portion of the annular wall and extending generally outwardly and upwardly therefrom to form a generally upwardly and inwardly concave surface;

a top rim wall circumferentially continuous with an upper portion of the annular rim wall and extending generally outwardly therefrom; and

a skirt wall circumferentially continuous with an outer portion of the top rim wall and extending generally downwardly therefrom; wherein

the first slanting wall and the annular wall are interrupted by a plurality of projections, each of said plurality of projections having an upper surface portion forming a generally concave surface concavely continuous with a respective portion of the generally concave surface formed by the annular rim wall, said concave surface having an outer upwardly opening surface portion defined at least in part by the annular rim wall and an inner upwardly opening surface portion defined at least in part by an upwardly extending shoulder portion of each projection.

4,311,239

TELEVISION PANEL PACKAGE

Melvin C. Schlicker, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

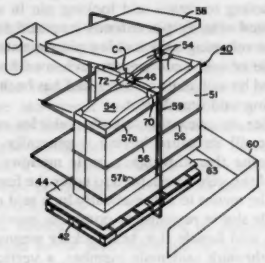
Filed Apr. 21, 1980, Ser. No. 142,231

Int. Cl.³ B65D *19/00*

U.S. Cl. 206—597 **16 Claims**

1. A support column for securely supporting a plurality of objects in a column wherein said support column comprises an integrally formed rigid quadrant portion of a cylinder having adjoining sides meeting at an axial corner and free ends thereof terminating at a selected radial distance from said corner, and a cylindrical surface joining the free ends of the adjoining sides, said support column formed with a plurality of axial spaced niches for receiving therein a corner portion of an object to be supported, each niche is formed radially inwardly of the cylindrical surface of the quadrant portion and includes

a lower support surface for receiving thereon a corresponding lower part of said corner portion of the object disposed in said niche in spaced relation to an axial adjacent one of said objects, and a locating boss located in opposition to the lower support



surface for axially engaging a corresponding upper part of the corner portion of the object in opposition to the said lower part for securing said object axially against said lower support surface upon application of a radial force of the object against the column.

4,311,240

FLOTATION APPARATUS

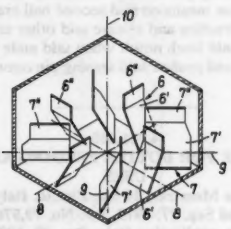
Horst Auerbach, Mülheim-Ruhr; Rainer Nebe, Mülheim, and Armin Supp, Essen, all of Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränhter Haftung, Essen, Fed. Rep. of Germany

Filed Aug. 22, 1979, Ser. No. 68,585

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1978, 2839758

Int. Cl.³ B03D *1/16*

U.S. Cl. 209—169 **16 Claims**



1. A floatation apparatus having a rotor adapted to be rotated about an axis of rotation, said rotor including an impeller shaft having a drive-receiving end and adapted to be rotated, said rotor also including a disc operatively connectable to that end of said impeller shaft which is remote from said drive-receiving end thereof, and said apparatus comprising in combination:

an effective quantity of stabilizer means having edges adapted to comminute suspeded solid material particles and air bubbles dispersed therewith unhindered by any shroud for lifting force, each of said stabilizer means, at least at the effective height of said rotor, being inclined counter to direction of rotation for downward deflection with respect to a line perpendicular to the axis of rotation of said rotor which accelerates the particles and air bubbles essentially horizontally in a spiral path of movement, the downward deflection and lifting force being substantially equalized.

4,311,241

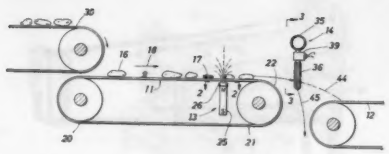
METHOD FOR SEPARATING CLODS AND THE LIKE FROM POTATOES

F. Hilton Lacy, Jr., Houston, Tex., and Christopher H. Weis, Salt Lake City, Utah, assignors to Lockwood Corporation, Gering, Nebr.

Filed Nov. 13, 1979, Ser. No. 93,269

Int. Cl.³ B07C *5/344*

U.S. Cl. 209—570 **7 Claims**



1. Method for separating clods and the like from potatoes, which comprises the steps of:

creating a magnetic field;

positioning a coil in said magnetic field;

conveying said clods and potatoes through said magnetic field;

detecting the signal induced in said coil by a clod conveyed through said magnetic field;

removing said clods from said potatoes in response to said signal.

4,311,242

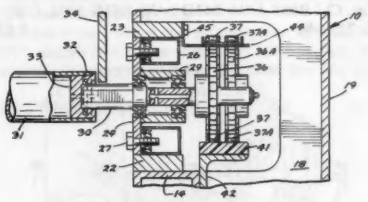
BEARING CARTRIDGE SUPPORTS FOR ROLL SCREENS AND THE LIKE

Karl J. Hnatko, Hibbing, Minn., assignor to Taconite Engineering & Manufacturing Co., Hibbing, Minn.

Filed Jan. 29, 1981, Ser. No. 229,343

Int. Cl.³ B07B *1/14*

U.S. Cl. 209—668 **14 Claims**



1. A bearing cartridge support for roll apparatus which comprises:

(A) a vertical bearing support plate, said plate having:

(1) lap tongues along its opposite vertical edges, and

(2) vertically spaced apart fastening means,

(B) a bearing cartridge supported by said plate and extending perpendicular thereto, said cartridge including:

(1) a hollow housing, and

(2) a pair of spaced apart bearings within the housing, and

(C) a short roll-supporting stub shaft journaled for rotation in said bearings, one end of said shaft being torgue transmitting in cross section and engageable by one end of a roll to be supported and rotated thereby.

4,311,243

ASSEMBLING MEMBERS

Chen Hui-Lai, No. 2, Lane 38, Shungchian Rd., Taipei, Taiwan

Filed Apr. 25, 1980, Ser. No. 145,268

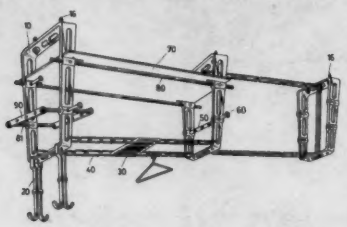
Int. Cl.³ A47J *51/00*; A47F *13/00*

U.S. Cl. 211—113 **7 Claims**

1. A set of assembling members for constructing a supporting device comprises:

at least two substantially hollow quadrilateral brackets having a plurality of openings provided on the sides thereof, and traversed protrusions provided correspondingly on a pair of opposed sides thereof each protrusion having a through way therein;

at least two chains composed of a number of substantially S-shaped members to engage with the longitudinal openings of said hollow rectangular brackets; positioning



plates having parallel traversed openings therein for engaging with said chains so as to space at least two said chains mounted in parallel on said brackets;

first bar members for extending through corresponding through ways of said brackets; and plates having four longitudinal slots located at corner portions thereof respectively for receiving the opposed sides of said brackets so as to allow said plates to be supported on said protrusions.

4,311,244

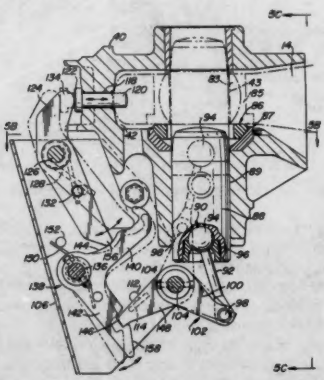
AUTOMATIC COUPLER TO CONNECT CONVERTIBLE RAIL-HIGHWAY VEHICLES END TO END

Eugene Hindin, Bala Cynwyd, Pa.; Alan R. Cripe, and Christopher A. Cripe, both of Richmond, Va., assignors to Bi-Modal Corporation, Greenwich, Conn.

Filed Feb. 28, 1980, Ser. No. 125,506

Int. Cl.[3] **B60F** *1/04;* **B61D** *3/10;* **B61G** *1/02, 5/00*

U.S. Cl. 213—86 **8 Claims**



1. In a coupler to releasably couple vehicles end to end including a rear sill structure having a generally horizontal female slot opening therethrough, a male member extending from the front of the vehicle adapted to enter the female slot of a forward vehicle; means to automatically lock said male member in said female slot in response to complete insertion of said male member in said female slot, said locking means including a vertical hole through said male member, a vertical bore in said rear sill structure opening into said female slot, a sensing pin slidably mounted horizontally in said rear sill structure and extending into said female slot in a position opposite its opening through the rear sill structure, a vertical locking pin slidable in said vertical bore, a first means operatively connected to said locking pin urging it upwardly into said female slot, a second means acting on said sensing pin urging it inwardly into said female slot, and latch means interengaging said first and second means acting to retain said locking pin in a retracted position when said sensing pin extends into said female slot, said latch means releasing said locking pin for extension into said vertical hole of said male member when said sensing pin has been engaged by said male member and has been pushed to a position clearing said female slot.

7. In a coupler to releasably couple vehicles end to end including a rear sill structure having a generally horizontal female slot opening therethrough, a male member extending from the front of the vehicle adapted to enter the female slot of a forward vehicle; means to automatically lock said male member in said female slot in response to complete insertion of said male member in said female slot, said locking means including a vertical hole through said male member, a vertical bore in said rear sill structure opening into said female slot, a sensing pin slidably mounted horizontally in said rear sill structure and extending into said female slot in a position opposite its opening through the rear sill structure, a vertical locking pin slidable in said vertical bore, a first bell crank having a pair of arms extending from a corner and mounted at its corner for rotation on said rear sill structure, link means pivotally interconnecting one arm and said vertical locking pin, spring means urging said first bell crank in a counter-clockwise direction and said vertical locking pin upwardly into said female slot, a sensing lever having upper and lower ends and mounted for rotation intermediate its ends, said upper end bearing against said sensing pin, spring means urging said sensing lever into a clockwise direction so that said sensing pin is forced into said female slot, and a second bell crank including upper and lower legs extending from a corner and mounted for rotation at its corner, cam means on said upper leg of said second bell crank engaging said lower end of said sensing lever, a releasable latch notch on said lower leg of second bell crank, and spring means urging said second bell crank in a counter-clockwise direction so that said latch notch engages the other arm of said first bell crank when said vertical locking pin is fully retracted, said sensing lever acting via said cam means on said second bell crank to rotate it in a clockwise direction and release said other arm of said first bell crank from said latch notch when said male coupler member has engaged and pushed said sensing pin outwardly to clear said female slot.

4,311,245

BABY BOTTLE FOR BOTTLE FEEDING AND OTHER USES

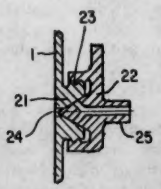
Carlo Maffei, Via Maestrale 10 bis, Pistoia, Italy

Filed Sep. 27, 1979, Ser. No. 79,578

Claims priority, application Italy, Sep. 29, 1978, 9601 A/78; Mar. 9, 1979, 9362 A/79; Sep. 6, 1979, 9530 A/79

Int. Cl.[3] **A61J** *9/04*

U.S. Cl. 215—11 B **6 Claims**



4. In a baby bottle for bottle feeding of the type wherein a perforated rubber nipple is connected to the mouth of the bottle, and a valve is connected to a wall of said bottle to

provide an air vent passageway to facilitate nursing of the baby, wherein the improvement comprises:

a perforated seat portion for said valve formed integrally with the wall of said bottle to define said passageway, and a shutter portion engagable with said seat portion;

fastening means for adjustably mounting said shutter to said seat;

interfitting means on said seat and said shutter disposed for relative movement thereof between a sealed position to close said valve and a non-sealed position to open said valve for regulating flow through said passageway, said relative movement being controlled by the position to which said shutter is mounted to said seat;

said nipple comprising an apertured button end portion adapted to be received in the baby's mouth for sucking and a base portion spaced from said mouth sucking button end portion; and,

said base having a wall portion of reduced thickness as compared to the wall thickness of the remainder of said nipple, said reduced wall thickness portion being displaced to a position indicative of the vacuum existing inside said bottle during sucking,

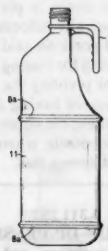
whereby said valve is effective to reduce the vacuum in said bottle to a level to prevent collapsing of the nipple and thereby to prevent tiring of the baby during sucking so as to permit the baby to suck from said nipple continuously with little strength and without having to remove the bottle to reduce the vacuum.

4,311,246

SYNTHETIC RESIN BOTTLE WITH HANDLE

Tadao Saito; Masao Akutsu; Hiroaki Sugiura, and Shuzo Endo, all of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Jan. 18, 1980, Ser. No. 113,352
Claims priority, application Japan, Feb. 9, 1979, 54-14521
Int. Cl.[3] B65D *1/02*
U.S. Cl. 215—100 A 3 Claims



1. A synthetic resin bottle having a handle, a bottle body, and a neck, said bottle prepared by biaxially orienting a parison of a synthetic resin by a blow molding process and comprising:

a handle connected only to and protruding first laterally and then downwardly of a lower portion of the neck of said bottle and formed integrally with said lower neck portion by injection molding without biaxial orientation;

an upper body portion extending downward of said neck and biaxially oriented only in the direction away from said handle; and

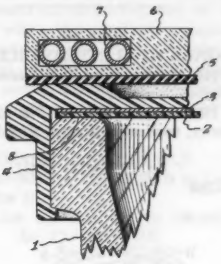
a lower body portion extending downwardly of said upper body portion and having its handle side biaxially oriented laterally to the lateral extent of the lower free end of said handle, and its side opposite its handle side biaxially oriented laterally to the lateral extent of the lower most part of said upper body portion, said lower body portion being formed with a bottom wall at its lower end.

4,311,247

GLASS CONTAINER AND THERMOPLASTIC CLOSURE COMBINATION

Michael T. Dembicki, and William J. Pond, both of Brockport, Pa., assignors to Brockway Glass Company, Inc., Brockway, Pa.

Division of Ser. No. 86,398, Oct. 19, 1979, Pat. No. 4,260,438.
This application Nov. 25, 1980, Ser. No. 210,175
Int. Cl.[3] B65D *51/00*; B32B *17/10*; B67B *3/00*
U.S. Cl. 215—232 6 Claims



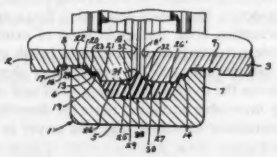
1. In combination, a glass container having a mouth comprising an upper rim with a sealing membrane comprising a thermoplastic material, said glass container rim having been heated to an elevated temperature and treated with a fluorine compound decomposable at said elevated temperature and said membrane being pressed against said rim at a temperature above the softening point but below the melting point of said thermoplastic material.

4,311,248

HIGH PRESSURE COUPLING APPARATUS

Herbert A. Westerlund, Port Washington, and Robert E. Westerlund, Mequon, both of Wis., assignors to Construction Forms, Inc., Cedarburg, Wis.

Continuation-in-part of Ser. No. 520,548, Nov. 4, 1974, Pat. No. 3,967,837, and a continuation of Ser. No. 837,534, Sep. 28, 1977, abandoned. This application Dec. 29, 1980, Ser. No. 220,817
Int. Cl.[3] F16J *15/02*
U.S. Cl. 277—206 R 10 Claims



1. A coupling gasket member adapted to be located within a cavity of a pipe end coupler for connecting aligned pipe members carrying a pressurized fluid medium, comprising a base ring portion formed of solid flexible material and having a centrally located and integrally connected inner projecting member adapted to extend between said pipe members with said ring portion overlying the pipe members, said ring portion having an inner peripheral wall including a pair of small annular recesses one to each side of the projecting member, said projecting member extending outwardly from the inner peripheral wall and of said recesses, each of said recesses having a width at the peripheral wall on the order of the maximum width of the projecting member at the inner peripheral wall and a depth less than said width of said projecting member and substantially less than one half the depth of the ring portion

and being located immediately adjacent to the projecting member, the axially outer sidewalls of the recesses being slightly inclined along substantially the total depth of the recesses to define a sealing lip at the inner peripheral wall surface deflected inwardly by the pipe member into a sealing position and maintaining said sealing lip spaced from said inner projecting member in the deflected sealing position by substantially the width of the recess with the lip deflected inwardly, said projecting member extending substantially beyond said peripheral wall in the non-sealing position and in the sealing position of the gasket.

4,311,249

CONTAINER WITH RELEASABLE CLOSURE

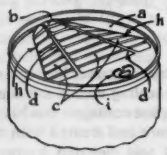
Michael F. Joyce, 25 Rangewood Ave., Kennet Valley, Reading, Berks. RG3 3NN, England

Filed Aug. 1, 1979, Ser. No. 62,780

Claims priority, application United Kingdom, Aug. 4, 1978, 32266/78

Int. Cl.³ B65D *17/32*

U.S. Cl. 220—268 **24 Claims**



1. A metal end cover for a container comprising a wall portion divided by a slit opening into a moveable actuating underlap part and a substantially static overlap part, the static overlap part overlapping the underlap actuating part at the margins of the slit opening and the overlap being closed with the underlap to form an overlapped edge leakproof seal; said end cover being further characterised in that the underlap actuating part includes an indentable actuating area remote from the area defined by the overlapped edge seal and not contacted by fluid flowing from a container closed by the cover after opening of the overlapped edge seal, said indentable actuating area being located on a line that intersects a line joining the ends of the slit in a direction away from the overlapped edge seal and being stiff in construction and able to transmit to the underlap part of the overlapped edge seal along the said intersecting line a seal separating force applied to the indentable actuating area, the application of external force at said indentable actuating area serving to break open the seal and form a substantially tubular passageway through the slit opening between the overlapping margins of said overlap static and underlap moveable actuating parts for directing fluid flow out from a container closed by the end cover in a spout-like manner.

4,311,250

CONTAINER HAVING INTERNAL WALL SURFACES MODIFIED TO REDUCE CARBONATION LOSS

Abraham Ravve, Lincolnwood, and Paxton M. Wilt, Downers Grove, both of Ill., assignors to The Continental Group, Inc., Stamford, Conn.

Filed May 12, 1980, Ser. No. 148,089

Int. Cl.³ B65D *81/24, 85/72*

U.S. Cl. 220—458 **16 Claims**

1. A container for liquid carbonated bverages comprising a hollow body having applied to the internal liquid contacting internal wall surfaces thereof a layer of an inert, water insoluble organic polymeric material wherein at least about 75% by weight of the layer being formed from a monomer containing hydrophilic chemical groups, the layer covering at least a major portion of the internal liquid contacting wall surfaces and present in an amount both effective to reduce carbon dioxide bubble nucleation on the internal walls of the container and accompanying carbonation loss from the beverage packaged therein.

4,311,251

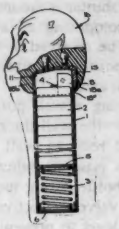
SPRING FOR DISPENSER COVER

Henry Sternberg, 24 Pell Pl., New Rochelle, N.Y. 10804

Filed Feb. 13, 1980, Ser. No. 121,018

Int. Cl.³ A24F *15/04*

U.S. Cl. 221—24 **14 Claims**



1. A receptacle for receiving and sequentially dispensing individual shaped bodies from a stack of like ones of said bodies received in the receptacle, comprising housing means having two opposed wall extensions at a dispensing end thereof, a pivotal cover at the dispensing end, spring means in the housing means for pressing the stack of shaped bodies towards the dispensing end to place sequential uppermost ones of the shaped bodies of the stack into a dispensing position, transverse ledge means located intermediate the opposed wall extensions, the uppermost shaped body being pressed by the spring means against the ledge means, a cap for said pivotal cover, mounting means for mounting said cap on said cover, said cap having a skirt portion extending around said pivotal cover, said skirt having a first portion engaging said cover, a second portion spaced from said first portion and adapted to engage said housing means when the cover is pivoted toward an open position and a pair of elastically deformable portions intermediate said first and second portions, said elastically deformable portions constituting a spring for biasing the pivoted cover into closed position, a pivot for pivoting the cover on the opposed wall extensions, and the cover having a finger portion in the region of the pivot for pushing the uppermost shaped body and dispensing it from the receptacle when the cover is pivoted against the last mentioned spring bias.

4,311,252

NAPKIN DISPENSER

Samuel N. Hope, Jr., Wauwatosa, and Edwin A. Filipowicz, Greenfield, both of Wis., assignors to Griffith-Hope Company, Milwaukee, Wis.

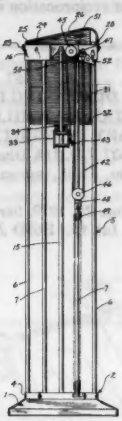
Filed Jul. 11, 1979, Ser. No. 56,782

Int. Cl.³ B65H *1/12*

U.S. Cl. 221—57 **4 Claims**

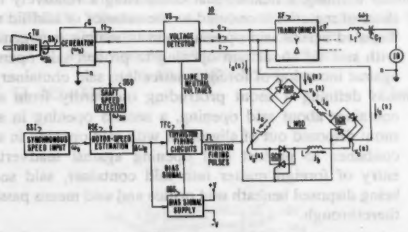
1. A large capacity elevator-type napkin dispenser, comprising a supporting structure, a cover connected to the upper end of the supporting structure and having an opening through which napkins are dispensed, support means mounted within the support structure for vertical movement therein and including a carriage, a stack of napkins to be supported on said support means, a cable having one end connected to the carriage and the opposite end operably connected to said supporting structure, biasing means for urging the carriage upwardly toward the opening in the cover to urge the stack of napkins against the undersurface of the cover, one-way locking means disposed to engage the cable when the cover is in an open position, said locking means being arranged to permit free movement of the cable in one direction to permit descent of the

carriage within the support structure and said locking means being arranged to prevent movement of the cable in the opposite direction and thereby prevent upward movement of the



carriage within the support structure, and release means responsive to movement of the cover from the open to the closed position to release said locking means and thereby permit free movement of the cable in both directions.

4,311,253
LOW LOSS STABILIZER
Thomas H. Putman, Penn Hills Township, Allegheny County, and Donald G. Ramey, Churchill Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Sep. 14, 1979, Ser. No. 75,450
Int. Cl.³ H02H *7/06*
U.S. Cl. 322—25 **3 Claims**



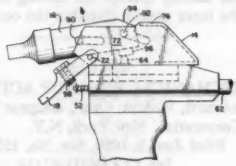
1. A compensator of the type which is connected to an alternating current electrical system in which it is desired to regulate system current regardless of a propensity for said system current to become unregulated in response to a deregulating stimulus, said compensator conducting any one of a plurality of controllable AC bias compensating currents for said electrical system, where controllable variation of compensating current about said AC bias currents is provided so that the total compensating current interacts with said system current to thus maintain said system current in a regulated state, comprising:

(a) bias determining means interconnected at an input thereof with said electrical system in such a manner that the extent of said deregulating stimulus is determined, said bias determining means providing an output signal indicative of in which range said extent of deregulating stimulus is present at a particular time, said range being any one of a plurality of predetermined ranges;

(b) variation determining means interconnected at an input thereof with said electrical system in such a manner that the effect of said deregulating stimulus within any of said ranges is determined, said variation determining means providing an output signal indicative of said effect at said particular time; and

(c) compensating means interconnected with said electrical system, said bias determining means, and said variation determining means for conducting said AC bias compensating current with said controllable variations as a function of said output signals from said bias determining means and said variation determining means, said bias compensating current changing as said range changes.

4,311,254
FOAM DISPENSING GUN
Gary Harding, Thonotosassa, Fla., assignor to Universal Foam Systems, Inc., New Berlin, Wis.
Filed Jun. 16, 1980, Ser. No. 159,461
Int. Cl.³ B05B *7/12*
U.S. Cl. 222—145 **13 Claims**



1. In a foam dispensing gun having a gun body with at least one passageway adapted to be connected to a pressurized supply of a fluid component, valve means for controlling the flow of fluid through said passageway and means for releasably retaining a disposable nozzle in fluid communication with said passageway downstream from said valve means, the improvement wherein said nozzle retaining means comprises:

fixed means on said gun body to engage and prevent movement of a disposable nozzle on one of two mutually perpendicular directional axes;

a breech slidable on said body between first and second positions in a direction parallel to said one directional axis; and

means on said breech to engage and support a disposable nozzle when said breech is in said first position.

4,311,255
HAND HELD CONTAINER AND DISPENSER ASSEMBLY
Philip Meshberg, 2500 S. Ocean Blvd., Bldg. 3, Apt. 1-A, Palm Beach, Fla. 33480
Filed Oct. 30, 1979, Ser. No. 89,394
Int. Cl.³ B05B *11/00*
U.S. Cl. 222—183 **9 Claims**

1. A dispensing package for fluids including a finger-actuated dispenser and a container, and comprising:

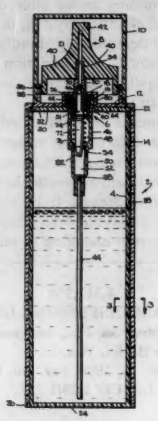
a tubular outer case having an open end and a closed end comprising an end wall having an aperture through which the actuator of the dispenser projects;

locking means at the closed end of the outer case for holding the dispenser in place;

a conformably fitting inner case, press-fitted into the outer case to form the container, the inner case having a closed end and an open end which is inserted into the outer case;

a passageway, located between the inner and outer case and extending the length of the outer case, for permitting air to

escape from the container when the cases are press-fitted together; and



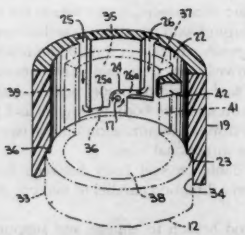
at least one seating surface for closing off the passageway when the inner case is seated in the outer case.

4,311,256

MECHANICAL BREAKUP ACTUATOR

Clyde B. DeArmitt, Walnut, Calif., assignor to Diamond International Corporation, New York, N.Y.

Filed Jun. 2, 1980, Ser. No. 155,664
Int. Cl.³ B65D *47/34*
U.S. Cl. 222—321 **9 Claims**



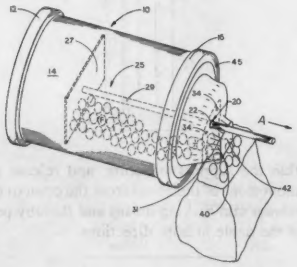
1. A mechanical breakup actuator for a container of fluid product, including a plunger through which the product is discharged upon reciprocation of the plunger, the actuator being mounted on said plunger for axial movement together therewith to effect the reciprocation and being mounted for rotation relative thereto, the actuator having a cylindrical sleeve closed at one end and snuggly engaging said plunger at an end thereof, the actuator having a product discharge orifice communicating with the interior of said sleeve, an inner surface of said sleeve having a cavity formed therein surrounding said orifice, said inner surface further having at least one groove formed therein extending tangentially into said cavity from said closed end of said sleeve, said plunger having a surface portion of a predetermined extent which covers said cavity and said groove in a first relative position of the actuator so as to respectively define a swirl chamber and a fluid passage, an outer end of said surface portion being spaced from said closed end of said sleeve, communication between said end of said plunger and said orifice in said first position thereby being established only via said passage, whereby the product is discharged through said orifice as a spray upon plunger reciprocation in said first position of the actuator, said surface portion uncovering said depression and said groove in a second relative position of the actuator to thereby establish direct communication between said end of said plunger and said orifice, whereby the product is discharged through said orifice as a stream upon plunger reciprocation in said second position of the actuator.

4,311,257

APPARATUS FOR DISPENSING FOOD STUFFS FROM A SANITIZED CONTAINER WHILE MAINTAINING THE SANITARY INTEGRITY THEREOF

Frank G. Grieco, 42637 R.D. 114, Dinuba, Calif. 93618, and Vito R. Lovero, Dinuba, Calif., assignors to Frank G. Grieco, Sultana, Calif.

Filed Jun. 25, 1979, Ser. No. 51,707
Int. Cl.³ B65D *25/38*
U.S. Cl. 222—387 **6 Claims**



1. Apparatus for dispensing dry food stuffs from a container while maintaining the sanitary integrity of the remainder thereof comprising

a container having a base member, a cylindrical barrel, and a lid

an orifice formed in the lid of said container

means defining an opening in the wall of the lid of said container beneath said orifice

means passing through said orifice, movable to urge food stuffs in said container to and through said opening,

means defining a flexible seal comprising a relatively thin sheet of material connected to the exterior of said lid and disposed across said opening, and in sealing engagement with said lid about said opening to protect said opening against incursion of foreign matter into said container,

means defining a snout protruding outwardly from said container about said opening, a second opening in said snout disposed out of alignment with said opening in said container to protect said opening against inadvertent entry of foreign matter into said container, said snout being disposed beneath said orifice and said means passing therethrough.

4,311,258

TUCK POINTING GUN WITH FLEXIBLE PLUNGER

Paul C. Bradshaw, Norwood, Mo., assignor to Dale W. Clark, Kansas City, Kans., a part interest

Filed May 30, 1980, Ser. No. 154,883
Int. Cl.³ G01F *11/00*
U.S. Cl. 222—391 **1 Claim**

1. A tuck pointing gun, comprising:

an elongated, tubular, mortar-receiving barrel;

means adjacent one end of said barrel defining a a mortar outlet;

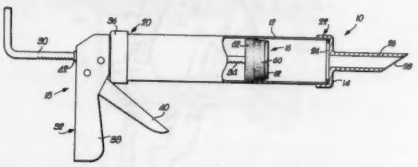
said outlet-defining means including an annular, inwardly extending element adjacent said outlet end and defining a mortar outlet of slightly lesser diameter than that of the remainder of said barrel;

a plunger disposed within said barrel;

means operably coupled with said plunger for selective movement thereof forwardly toward said one end for dispensing mortar through said outlet, and for selective movement of the plunger rearwardly toward the other end of said barrel for permitting reloading of the barrel with mortar,

said plunger including—a thin, flat, imperforate, circular, metallic plate presenting a forward face and a rearward face and of lesser diameter than that of said barrel;

an annular, flexible member coupled to said plate and extending outwardly therefrom for sealingly and wipingly engaging the surrounding barrel wall, said member presenting a radially restricted portion of lesser diameter than that of said barrel about said plate and an elongated, annular, rearwardly and radially outwardly extending trailing



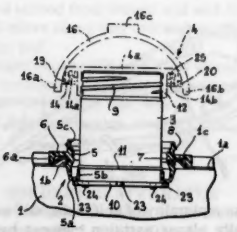
section having a portion thereof in engagement with said barrel wall, said barrel-engaging portion being spaced rearwardly from said plate, there being structure permitting inward deflection of the barrel-engaging portion thereof in the event of a flow-preventing blockage at said outlet end, said deflection permitting structure comprising an internal, annular void formed in said trailing section, said member also including an annular forward lip disposed about the periphery of said plate, in overlying engagement with a portion of the forward face thereof, extending forwardly therefrom and of a diameter less than that of said barrel, said lip being circumferentially beveled and arranged to be closely and nestingly received within said restricted diameter mortar outlet such that said plunger serves to substantially completely clear the barrel of mortar when said lip thereof is so nested.

4,311,259

RETRACTABLE POURER ASSEMBLIES

Pierre Babiol, Villefranche sur Saone, France, assignor to Societe Nouvelle de Bouchons Plastiques, Anse, France

Filed Apr. 30, 1980, Ser. No. 145,287
Int. Cl.³ B65D *25/44*
U.S. Cl. 222—525 **4 Claims**



1. A retractable pourer assembly to be mounted in an opening in a receptacle, comprising:

(a) an annular based shaped to be entered into and clipped in said opening, and having a hollow sleeve extending therethrough and supporting a flange overlying the periphery of the opening in the receptacle;

(b) a tubular pourer slidabley extending through said sleeve, the pourer having annular means to limit movement of the pourer along the sleeve, and having screw threads at its outer end;

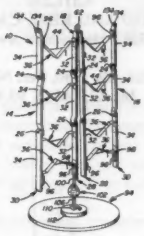
(c) a stopper having threaded skirt means operative to screw onto the threads of the pourer to close the outer end thereof, and the stopper having means yieldably retaining the stopper fixed to the base when the pourer is retracted in the base, and the stopper having pairs of lugs extending outwardly therefrom over said flange and having two half-rings supported by different pairs of the lugs and overlying the flange, each half-ring having opposite ends extending beyond the lugs and constituting feet overlying the flange, whereby when the half-rings are pivoted upwardly about the lugs away from the flange their feet will lever downwardly against the flange and disengage said means yieldably retaining the stopper fixed to the base.

4,311,260

GARMENT DISPLAY RACK

Malcolm D. Toy, 310 Peebles St., Sewickley, Pa. 15143

Filed Mar. 11, 1980, Ser. No. 129,242
Int. Cl.³ D06C *15/00*
U.S. Cl. 223—63 **13 Claims**



1. A garment display rack comprising,

a frame member for supporting and displaying a garment,

said frame member including an inner seam support and an outer seam support,

adjustment means secured to and extending between said inner and outer seam supports for maintaining said inner and outer seam supports in spaced relation,

said adjustment means being expandable and contractable in length between said inner and outer seam supports to permit movement of said inner and outer seam supports toward and away from each other to adjust the width of said frame member,

each of said inner and outer seam supports including a plurality of elongated elements positioned in end to end relationship, and

pivot means for connecting adjacent ends of said elongated elements to form for said inner and outer seam supports at least a pair of said elongated elements being independently pivotal to a preselected angular position so that said frame member is pivotal at a preselected pivot point along the length thereof.

4,311,261

MOTORCYCLE FUEL TANK CARRYING RACK

Gordon K. Anderson, 14632 Pacific St., Tustin, Calif. 92680, and James D. King, 6735 Pasito Ave., Alta Loma, Calif. 91701

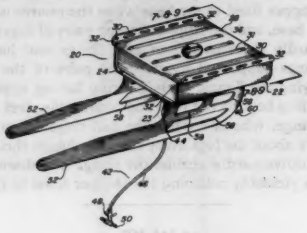
Filed May 30, 1980, Ser. No. 154,940
Int. Cl.³ B60P *3/22*
U.S. Cl. 224—31 **8 Claims**

1. An auxillary fuel tank and carrying rack for a motor driven cycle comprising;

a. a tank having a bottom, sides, front wall, rear wall and top platform forming an enclosure to receive and store liquid fuel;

b. means to transmit fuel from said tank to said cycle;

c. means to demountably engage items contiguous with said top platform defining a rack having tie down openings for carrying articles attached thereto; and



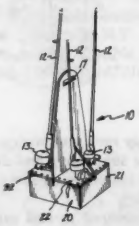
d. a plurality of arms having ends engageably mounted on the first end to said tank and demountably secured on the second end to said motor driven cycle.

4,311,262

ROD AND REEL CADDY

LeRoy D. Morin, 3602 Hampshire Ave. North, Minneapolis, Minn. 55427

Filed Feb. 19, 1980, Ser. No. 122,444
Int. Cl.[3] A01K *93/00*
U.S. Cl. 294—141 13 Claims



1. A fishing rod carrier device for transporting fishing rods with reels thereon, comprising:

a frame having a bottom for permitting the frame to rest on relatively flat surfaces when the fishing rod carrier device is in an upright position and having at least one flat side for permitting the frame to lie on the flat side when the fishing rod carrier device is in a generally horizontal position;

a lower horizontal member mounted on said frame above the bottom of said frame and having a plurality of openings spaced from one another, said openings being larger than a fishing rod handle and smaller than a fishing reel mounted on said rod;

an upper horizontal member mounted on said frame above said lower horizontal member and having a like plurality of similarly sized openings relatively vertically aligned with the openings of said lower horizontal member;

a first vertical member having first and second substantially flat, generally parallel major surfaces mounted adjacent to said upper member, and extending upwardly to an end having a handle means thereon; and

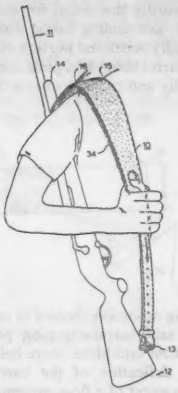
first and second vertical support means generally orthogonal to and attached to the upper horizontal member and engaging the first and second major surfaces, respectively, of said vertical member to maintain said vertical member perpendicular to said horizontal members, the first and second support means and the vertical member dividing the upper horizontal member into four separate regions, and wherein each separate region has one of the plurality of openings therein.

4,311,263

GUN SLING WITH THUMB SUPPORT

John E. Bianchi, 100 Calle Cortez, Temecula, Calif. 92390

Filed Oct. 15, 1979, Ser. No. 84,850
Int. Cl.[3] A41C *33/00*
U.S. Cl. 224—150 6 Claims



1. A gun sling comprising an elongated member of leather or leather-like material including attachment points at opposite end regions for securing to two spaced portions of a long gun;

said gun sling including intermediate broader width portion positioned to provide the contact area for the shoulder of the wearer;

said sling including a narrower lower portion for engagement with the butt region of the long gun to be carried in the sling; and

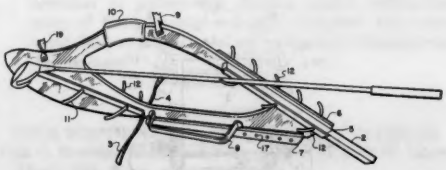
said sling defining a thumb hole extending through said sling in the region between intermediate broader region and the narrower lower region of the sling.

4,311,264

GOLF CLUB CARRIERS

Howard H. Hurmence, 918 Avalon Dr., Statesville, N.C. 28677

Filed May 3, 1979, Ser. No. 35,708
Int. Cl.[3] A63B *55/00*
U.S. Cl. 224—257 7 Claims



1. A carrier for a plurality of golf clubs, said carrier comprising: an essentially planar partition element having opposing face surfaces bounded by upper, lower, front and back edges, a plurality of golf club supports extending outwardly from at least one of said opposing face surfaces, each of said golf club supports comprising first means for supporting the head of a golf club adjacent said front edge, and second means for supporting the shaft of said golf club adjacent said back edge, means for carrying said carrier, said means for carrying and said first and second means being related so that when said

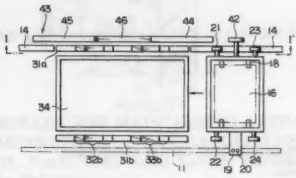
carrier is carried each golf club head is seated in its respective first means and rests against said one of said opposing face surfaces, whereby each of said golf clubs is spaced from adjacent golf clubs.

4,311,265

SOLDERING OF PRINTED CIRCUIT BOARDS

Kenshi Kondo, c/o Nihon Dennetsu Keiki Kabushiki Kaisha, No. 27-1, Shimomaruko 2-chome, Ohta-ku, Tokyo, Japan

Filed Dec. 18, 1979, Ser. No. 104,721
Claims priority, application Japan, Jan. 9, 1979, 54/415
Int. Cl.³ H05K *3/34*
U.S. Cl. 228—40 **12 Claims**



1. An apparatus for applying solder to printed circuit boards, comprising:

a carrier adapted to support a printed circuit board;

first front and rear wheels mounted at one side of said carrier;

second front and rear wheels mounted at the other side of said carrier;

a pair of laterally spaced first and second track members, said first track member being engagable by said first front and rear wheels and said second track member being engagable by said second front and rear wheels of said carrier, whereby said carrier is able to be supported on said first and second track members by said first and second front wheels and said first and second rear wheels;

drive means for displacing said carrier along said track members;

a solder vessel containing molten solder and located between said first and second track members;

first and second depressions of the same depth formed in each one of said first and second track members at predetermined positions for simultaneously receiving said first and second front wheels and said first and second rear wheels, respectively;

each one of said first and second depressions having a length and a depth sufficient to allow the underside of said printed circuit board on said carrier to be brought into contact with the molten solder in said solder vessel when said first and second front wheesl and said first and second rear wheels move along said first and second depressions, respectively; and

third track means engageable by a third wheel means of said carrier for preventing said first and second front wheels and said first and second rear wheels from engaging said second and first depressions, respectively.

4,311,266

SOLDERING APPARATUS

Kenshi Kondo, c/o Nihon Dennetsu Keiki Kabushiki Kaisha, No. 27-1, Shimomaruko 2 chome, Ohta-ku, Tokyo, Japan

Filed Dec. 18, 1979, Ser. No. 104,723
Claims priority, application Japan, Dec. 25, 1978, 53-158659; Dec. 25, 1978, 53-158600
Int. Cl.³ H05K *3/34*
U.S. Cl. 228—40 **10 Claims**

1. An apparatus for soldering printed circuit board, comprising:

a carrier adapted to support a printed circuit board; means for moving said carrier along a predetermined transfer path;

a moveable plate mounted for vertical movement on a support means provided adjacent a predetermined position along said transfer path;

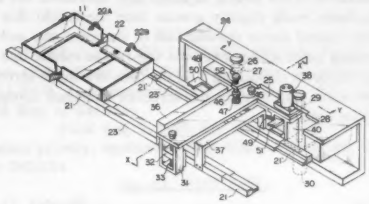
means for moving said moveable plate up and down by a predetermined distance;

a pair of transversely spaced parallel rails defining part of said transfer path and adapted for supporting engagement with said carrier, said rails each rotatably attached at the center to said moveable plate;

a link member bridged between and operatively connecting said paired rails and said moveable plate;

a molten solder vessel located beneath the space between said rails;

a vertically moveable element provided on and moveable



with said moveable plate for engagement with one of said rails at a position distant from the center thereof;

means for moving said moveable element up and down by a desired distance to rotate said one rail relative to the attachment point of said one rail to said moveable plate; and

means for holding said carrier at a predetermined position on said rails,

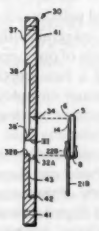
whereby said carrier moving means moves said carrier onto said spaced rails, over said solder vessel, and is held in position by said carrier holding means, the circuit board and said carrier being lowered into and out of said solder vessel by the paired rails being lowered and raised by movement of said moveable plate, with the angular attitude of the circuit board relative to the solder vessel being changed by movement of said vertically moveable element.

4,311,267

METHOD OF SCREENING PASTE SOLDER ONTO LEADED HYBRID SUBSTRATES

Linda W. Lim, San Mateo, Calif., assignor to GTE Automatic Electric Laboratories, Inc., Northlake, Ill.

Division of Ser. No. 35,953, May 4, 1979, Pat. No. 4,270,465.
This application Dec. 1, 1980, Ser. No. 211,953
Int. Cl.³ B23K *1/12*
U.S. Cl. 228—180 A **6 Claims**



1. The machine method of contact printing paste solder onto

lead pads and component pads on one side of a leaded hybrid substrate in a single printing operation, the pads being arranged in a prescribed pattern on the one side of the substrate with tines of leads pressed over one end thereof such that first tines contact and extend over associated lead pads, and second tines contact the other side of the substrate for mechanically attaching leads thereto, comprising the steps of:

locating the other side of the leaded hybrid substrate on a platen,

locating an apertured stencil over the substrate with the bottom of the stencil contacting the one side of the substrate and/or conductive elements thereon, with apertures aligned with associated pads and with first tines located in associated first apertures, the thickness of the area of the stencil containing second apertures that are associated with component pads being significantly less than the thickness of the stencil adjacent first apertures, the latter thickness being slightly greater than the height that first tines extend above the one side of the substrate, and

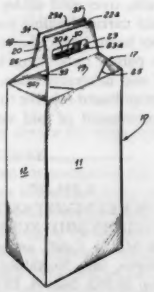
screening paste solder over the top of the stencil and into apertures for depositing it on the pads in a single screening operation, and passing the screened substrate through a solder bath.

4,311,268

FOOTWEAR BOX WITH HANDLES

Dante R. Soliven, 129 Esteban Abada St., Loyola Heights, Quezon City, Philippines

Filed Sep. 2, 1980, Ser. No. 183,577
Int. Cl.³ B65D *5/38, 13/06, 5/46*
U.S. Cl. 229—9 **5 Claims**



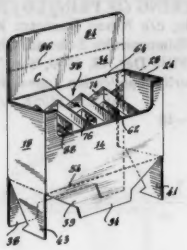
1. Combined handle and locked end closure means for a box formed of cardboard or the like stiff but bendable sheet material and having opposed pairs of side walls, comprising a pair of end flaps respectively integral with and extending outwardly from corresponding ends of one opposed pair of side walls, said end flaps each having a base portion adjacent the side wall from which it extends and an outer end portion remote from said side wall, the outer end portions of said flaps each having a finger slot therein whereby said end flaps serve as handle means when erected outwardly beyond said side walls, the base portion of one of said end flaps having slit means therein adopted to receive parts of the outer end portion of the other flap, whereby said end flaps serve as locked end closed means for the box when the same are bent inwardly one under the other and the outer end portion of the other flap is inserted in said slit means.

4,311,269

MULTI-CELL DIVIDER CARTON

James Montealegre, St. Paul, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed May 30, 1980, Ser. No. 154,792
Int. Cl.³ B65D *5/48*
U.S. Cl. 229—28 R **19 Claims**



1. A multi-cell divider carton comprising

a front wall,

a substantially parallel rear wall,

a pair of side walls connecting said front and rear walls,

a bottom wall,

a top wall cover element hingedly connected to said rear wall, and

a divider panel secured to a side edge of said rear wall positioned within the interior of said carton between said front, rear, and side walls, said divider panel including

a portion secured to said rear wall and a second portion secured to said front wall,

a divider wall substantially parallel to and spaced from said front and rear walls extending substantially the entire width of said carton between said side walls, said divider wall being hingedly connected to said first divider wall portion secured to said rear wall by

a first set of a plurality of parallelogram strips hingedly connected to said portion secured to said rear wall and said divider wall, and

a second set of a plurality of parallelogram strips extending between a portion of said divider panel secured to said (rear) wall and the portion of said divider panel secured to said front wall above said first set of parallelogram strips extending between the portion of said divider panel secured to said rear wall and said divider wall,

said first and second sets of parallelogram strips having individual strips lying in corresponding vertical planes to form with said divider wall a plurality of compartments within said carton.

4,311,270

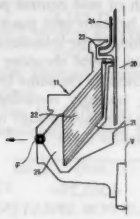
CENTRIFUGE

Oscar G. Hovstadius, Sigtuna, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Jan. 9, 1980, Ser. No. 110,626
Claims priority, application Sweden, Jan. 19, 1979, 7900523
Int. Cl.³ B04B *1/10, 11/00*
U.S. Cl. 233—46 **14 Claims**

1. For separating a mixture of components, a centrifugal separator comprising a rotor forming a separating chamber and having outlets for two separated fractions of the mixture, the rotor forming a discharge flow path through the outlet for one of said fractions, and a vortex fluidic device in said discharge path for automatically controlling the flow therethrough, said vortex device having a spin chamber with an inlet connected to said separating chamber, the spin chamber being incapable

of further separation of said one fraction entering said inlet, the vortex device being operable to increase the flow through the



spin chamber with increasing viscosity of said one fraction and vice versa.

4,311,271

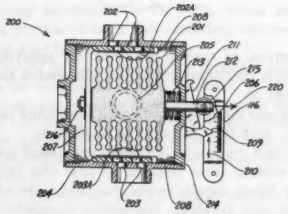
CONTROLLER FOR MAINTAINING A CONSTANT TEMPERATURE OF DISCHARGED LIQUID

Zargham H. Naqvi, C-13, Sadat Colony, Karachi-25, Drigh Township, Pakistan

Filed May 29, 1980, Ser. No. 154,297

Int. Cl.³ G05D *23/13*

U.S. Cl. 236—12 R **1 Claim**



1. A controller for combining two sources of liquid at two disparate temperatures to achieve mixed liquid at a predetermined temperature comprising:

(a) a mixing chamber having a first inlet port for allowing a first source of liquid at a first temperature to flow therein and a second inlet port for allowing a second source of liquid at a higher temperature than said first temperature to flow therein, said mixing chamber having an outlet port for allowing said mixed liquid in said mixing chamber to flow therefrom;

(b) a slidable housing having an aperture associated with each of said inlet ports respectively, said slidable housing disposed within said mixing chamber and adapted to be moved relative to said inlet ports to allow the first of said sources of liquid to enter said mixing chamber and to prevent said liquid at said higher temperature from entering said mixing chamber;

(c) means for setting a predetermined temperature level operatively connected to said slidable housing, said setting means comprising:

(i) a spring loaded shaft operatively connected to said slidable housing for movement therewith;

(ii) a cam follower rotatably mounted on said shaft; and

(iii) an inclined block slidably affixed to said slidable housing and in operative relationship to said cam follower for movement therewith, such that a movement of said inclined block to a position representative of a predetermined temperature level produces a corresponding movement of said slidable housing relative to said inlet ports, thereby allowing one of said sources of liquid to enter said mixing chamber and preventing the other of said sources of liquid from entering said mixing chamber, said inclined block including a pointer for indicating a predetermined temperature level when said means for setting a predetermined temperature level is set;

and

(d) an expandable enclosure filled with gas adapted to actuate said slidable housing, whereby liquid from said first source at said first temperature flows into said mixing chamber and liquid from said second source at said higher temperature is prevented from flowing into said mixing chamber when the temperature of the mixed liquid in the mixing chamber is higher than the predetermined temperature, and whereby liquid from said second source at said higher temperature flows into said mixing chamber and liquid from said first source at said first temperature is prevented from flowing into said mixing chamber when the temperature of the mixed liquid in the mixing chamber is lower than the predetermined temperature.

4,311,272

BIMETALLIC CONTROLLED STEAM TRAP

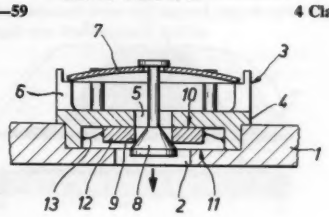
Werner Föller, Stuhr, Fed. Rep. of Germany, assignor to GESTRA-KSB Vertriebsgesellschaft mbH & Co. KG, Bremen, Fed. Rep. of Germany

Filed Aug. 7, 1980, Ser. No. 176,179

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1979, 2932114

Int. Cl.³ F16T *1/08*

U.S. Cl. 236—59 **4 Claims**



1. In a steam trap of the type including a housing having a separating wall in which is formed a lead aperture for establishing communication between the prepressure and low pressure sides thereof, a bimetallic control element mounted on said prepressure side, a valve seat, and a stroke-movable locking part disposed for cooperation with said valve seat which is biased in the opening direction and is actuated by said bimetallic control element, the improvement comprising:

said bimetallic control element including at least one bimetallic snap disk and said valve seat being provided on a stroke-movable element which is disposed for limited movement generally along a portion of the stroke of said locking part such that the maximum stroke path of said valve seat is only a part of the operating stoke of the locking part.

4,311,273

VARIABLE THICKNESS FABRIC MAT FOR RAILWAY TRACK STRUCTURE AND METHOD

Ronald P. Marsh, St. Louis, Mo., assignor to True Temper Corporation, Cleveland, Ohio

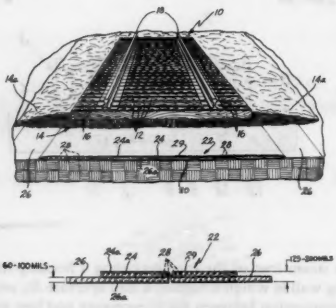
Filed Mar. 28, 1980, Ser. No. 134,787

Int. Cl.³ B32B *5/06, 5/26;* E01B *3/44*

U.S. Cl. 238—1 **28 Claims**

1. A method of providing for spreading of the load due to wheeled traffic on a railroad track structure, comprising the steps of placing a variable thickness, elongated, integral, liquid pervious fabric mat of selected length on the earthern support surface so as to cover a selected length of the latter along the railroad right of way, placing a layer of ballast including sloping shoulder portions on said mat and placing the track struc-

ture including the ties and the rails on the ballast layer, extending lengthwise of the underlying mat in general alignment therewith, with said mat being of sufficient width so as to substantially completely underlie the transverse extent of the track structure including the ties and the rails, with the mat comprising a thicker central portion where it directly underlies said track structure and thinner lateral portions projecting laterally outwardly beyond said transverse extent of said track structure, said central portion of said mat being of predetermined width and of selected and substantially uniform thickness throughout its length, each of said lateral portions being of lesser thickness and width as compared to the respective thickness and width of said central portion, but being of substantially the same length as said central portion, said mat comprising a plurality of stacked, generally equal length individual layers of fabric material connected together into an integral member and being porous so as to readily pass liquid therethrough but being of such porosity as to prevent the passage of soil particles greater than a predetermined size therethrough, to thereby aid in preventing contamination of said ballast layer, the shoulder portions of said ballast layer overlying and resting on said lateral portions of said mat, said mat extending lengthwise in general alignment with the lengthwise extension of said track structure and said lateral portions being disposed generally laterally of the vertical planes defining the side confines of the track structure and beneath said shoulder portions of said ballast layer.



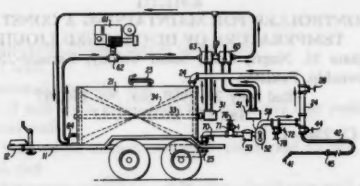
5. A variable thickness, elongated, integral synthetic fabric mat pervious to liquid and which includes nonwoven needle punched fabric material, adapted for use beneath a railroad track structure lengthwise of the latter for spreading the load on the track structure over an increased area, said mat comprising a plurality of stacked, generally equal length individual layers of fabric material connected together into an integral member, and being of selected length and comprising a central portion of predetermined width and of selected and substantially uniform thickness throughout its length and lateral portions on both sides of said central portion, each of said lateral portions being of lesser thickness and width as compared to the respective thickness and width of said central portion but being of substantially the same length, said central portion being adapted to extend lengthwise of the track structure beneath the latter with said lateral portions being adapted to be disposed generally laterally outwardly of the vertical planes defining the side confines of the track structure.

23. In combination with a railroad track structure, including spaced ties, a non-woven, needle punched, liquid pervious, elongated integral fabric mat disposed beneath said structure and extending along beneath said structure lengthwise thereof for a predetermined distance, to provide a generally resilient base for the track structure, a layer of ballast disposed on top of said mat and supporting thereon the ties of the railroad track structure, said mat comprising a plurality of stacked, generally equal length individual layers of fabric material connected together into an integral member, and including a central portion of predetermined width and of selected and substantially uniformed thickness throughout its length and lateral shoulder portions on both sides of said central portion of a thinner thickness and lesser width as compared to the respective thickness and width of said central portion, said central portion being disposed beneath said track structure so as to generally completely underlie the transverse dimension of said track structure, with said lateral shoulder portions extending extending lengthwise generally the same length as said central portion and projecting laterally outwardly of the vertical planes defining the side confines of said track structure, and being covered by said ballast layer.

4,311,274
MOBILE APPARATUS FOR SPRAYING PROTECTIVE COATINGS

W. Harold Neal, Rt. 10, Carrollton, Ga. 30117

Filed Sep. 14, 1978, Ser. No. 942,399
Int. Cl.[3] B05B 9/00
U.S. Cl. 239—1 4 Claims



1. A method of sealing pavement by applying asphalt or coal-tar-pitch emulsions containing suspended sand, comprising the steps of:

agitating said emulsion containing suspended sand in a reservoir to maintain said sand in suspension;

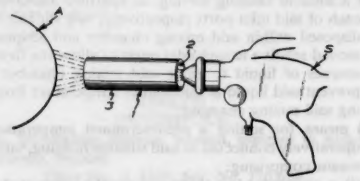
filtering said emulsion containing suspended sand through a high volume filter selected to pass said suspended sand and to block objects larger than said suspended sand; and

pumping said emulsion containing suspended sand under pressure through a spray nozzle onto a paved surface.

4,311,275
DEVICE FOR USE IN APPARATUS FOR THERMAL SPRAYING

Erik A. Lindkvist, Korpralsvägen 38, S-902 53 Umea, Sweden

Filed Dec. 12, 1979, Ser. No. 103,083
Claims priority, application Sweden, Dec. 18, 1978, 7813009
Int. Cl.[3] B05B 17/06
U.S. Cl. 239—102 9 Claims



1. A device for use in an apparatus for thermal spraying, i.e. for the application of metal, metal alloys, ceramets, carbides, ceramic metals, plastic materials or the like by means of heat and a pressure medium, in order to form a coating layer on a workpiece, comprising a per se known spraying apparatus provided with a nozzle, and a means (3), including a through opening or passage (2), and placed after the spray nozzle to compress or densify the otherwise conically flaring spray jet consisting of finely divided droplets or particles, wherein a wall (3) defining said passage (2) is subjected to the action of an

oscillation or vibration generator setting the wall in controlled oscillatory or vibratory motion.

4,311,276
VARIABLE AREA NOZZLE FOR A GAS TURBINE ENGINE

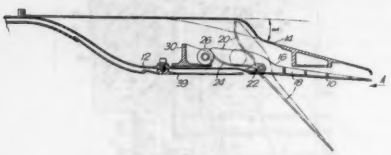
John M. Hall, Bristol, England, assignor to Rolls-Royce Limited, London, England

Filed Jun. 11, 1979, Ser. No. 47,554

Claims priority, application United Kingdom, Jun. 24, 1978, 27820/78

Int. Cl.³ B64C *15/02*

U.S. Cl. 239—265.39 **3 Claims**



1. A jet pipe and variable area final nozzle assembly for a gas turbine engine, comprising:

a jet pipe having a downstream end;

a plurality of nozzle flaps each connected by means of a fixed pivot to substantially the downstream end of the jet pipe for pivoting movement to vary the outlet area of the nozzle, a portion of each flap extending upstream of said pivot and overlying said jet pipe;

an outer fairing having a maximum diameter substantially equal to the maximum jet pipe diameter, fixed to said jet pipe and surrounding the downstream end of said jet pipe and said nozzle flaps, said jet pipe being necked downstream of its connection to the fairing to a diameter more nearly equal to but not less than the maximum throat area of the nozzle;

an annular space defined by the necked portion of said jet pipe and portions downstream therefrom, and the corresponding portions of said outer fairing; and

an actuation system disposed in said annular space, comprising:

a translatable ring disposed around said jet pipe;

an actuating mechanism connected to said fairing for translating said translatable ring; and

interconnecting means for interconnecting said translatable ring and said nozzle flaps, to operate said flaps, said ring being interconnected to said flaps upstream of said pivot and being located upstream of said pivot, said actuating mechanism being connected to said fairing on the downstream side of said translatable ring, the translation of said ring causing the pivoting of said flaps.

4,311,277
FUEL INJECTOR

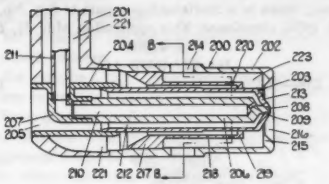
John F. Stratton, Blackburn, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jun. 20, 1979, Ser. No. 50,555

Int. Cl.³ B05B *7/10*

U.S. Cl. 239—400 **4 Claims**

1. A fuel injector assembly comprising an elongate body, means defining first and second passages extending longitudinally of the body, said first passage being a liquid fuel passage and said second passage being an air passage in at least one mode of use of the injector, an air inlet opening through the body communicating with the upstream end of said second passage, a first ring of outlet orifices in the body communicating with the first passage, a second ring of outlet orifices in the body communicating with the second passage, each outlet orifices of the first ring opening into the second passage in substantially coaxial alignment with a respective outlet orifice of the second ring, each outlet orifice of the second ring being of greater cross-sectional area than the respective outlet orifice of the first ring, and the orifices of the first and second rings lying on axes which are disposed at an acute angle with respect to the longitudinal axis of the body so that, in use, a fuel and air mixture is ejected from the orifice in the second ring to blend together to form a substantially conical discharge, a third passage for air extending longitudinally of said body having an



outwardly flared frustoconical outlet orifice defined by a radially inwardly directed annular lip, the inner periphery of said frustoconical orifice being substantially coaxially disposed about said second ring of outlet orifices and radially spaced therefrom to direct air from said third passage radially inwardly towards said second ring of outlet orifices so that the fuel/air mixture ejected from said second ring of outlet orifices passes through said frustoconical orifice.

4,311,278
NOZZLE INJECTION UNIT

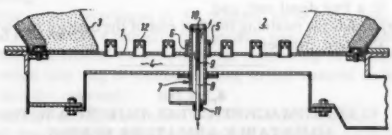
Gordon W. Sutton, Bisley, England, assignor to The British Petroleum Company Limited, London, England

Filed Aug. 1, 1979, Ser. No. 62,629

Claims priority, application United Kingdom, Aug. 4, 1978, 32349/78

Int. Cl.³ F23D *19/00*

U.S. Cl. 239—419.3 **18 Claims**



1. A nozzle injection unit comprising first and second generally co-axial tubes, the second co-axial tube having an inlet at one end for a liquid fuel supply and the second co-axial tube being sealed at the other end and having at least one lateral outlet within the first co-axial tube, the first co-axial tube having lateral outlets at one end, the space between the first and second co-axial tubes being connectable to a supply of oxygen containing gas and the lateral outlets of the second co-axial tube being at a distance of not more than eight times and not less than twice the internal diameter of the first co-axial tube upstream of the lateral outlets of the first co-axial tube.

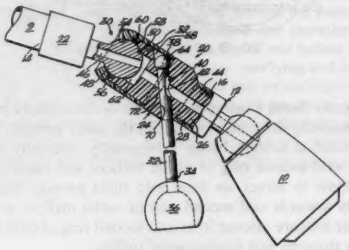
4,311,279
WATER FLOW CONTROL DEVICE FOR A SHOWERHEAD

Emile Jette, 1328 NE. 110 Ter., Miami, Fla. 33161

Continuation-in-part of Ser. No. 971,051, Dec. 19, 1978, abandoned, which is a continuation-in-part of Ser. No. 868,200, Jan. 9, 1978, which is a continuation-in-part of Ser. No. 863,694, Dec. 29, 1977, abandoned, which is a continuation-in-part of Ser. No. 818,441, Jul. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 790,277, Apr. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 743,766, Nov. 22, 1976, abandoned. This application May 21, 1979, Ser. No. 41,055

Int. Cl.³ B05B *1/32*

U.S. Cl. 239—562 **10 Claims**



1. A device for controlling both flow and direction of water through a showerhead from a supply line, which device comprises:

(a) a base member having a longitudinal flow passage therethrough;

(b) first means for pivotally connecting the base member to the supply line for receiving water through one end of the flow passage;

(c) second means for connecting the showerhead to the base member for directing water out the other end of the flow passage to the showerhead;

(d) an elongated control rod for pivoting the base member about the first pivotal connection means to control the direction of water flow from the showerhead, which control rod includes:

i. a first end rotatably journaled within the base member and including a valve passageway therethrough, with the longitudinal axes of the flow passage and control rod intersecting each other to define an acute angle which diverges outwardly from the first pivotal connection means, whereby water flow is permitted through the valve passageway in at least one position of rotation of the control rod and at least substantially terminated in at least one other position of rotation of the control rod, and

ii. a free distal end; and

(e) means for retaining the first end of the control rod within the base member.

4,311,280
ELECTROMAGNETIC FUEL INJECTOR WITH ADJUSTABLE ARMATURE SPRING

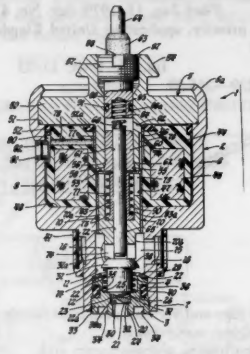
Richard S. Knape, Grand Rapids, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 21, 1980, Ser. No. 170,746

Int. Cl.³ F02M *51/06*

U.S. Cl. 239—585 **3 Claims**

1. An electromagnetic fuel injection valve having a housing means defining a generally cylindrical bore terminating at a fuel discharge passage at one end thereof, a solenoid pole piece fixed in the opposite end of said bore in said housing means, said solenoid pole piece means having a stepped aperture therethrough, a cup-shaped armature loosely positioned in said bore for movement in opening and closing directions to open and close the fuel discharge passage, a guide pin fixed to and axially extending from said armature in sliding engagement in said stepped aperture, a first spring in said bore effective at one end to bias said armature in said closing direction, a tubular abutment member positioned in said armature to loosely encircle said guide pin so as to extend outward a predetermined axial distance from said armature for engagement with said pole



piece whereby to fix the extent of armature movement in said opening direction, an externally accessible, adjustable screw threadingly received in said stepped aperture, and a spring means, including at least one spring positioned in said stepped aperture so as to abut at one end against said adjustable screw and effective at its opposite end to engage said guide pin whereby to bias said armature in said closing direction.

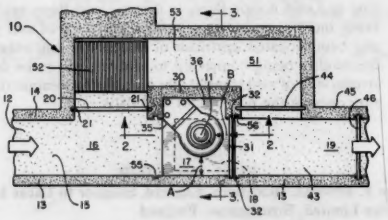
4,311,281
COMMINUTOR INSTALLATION

Frank G. Weis, Kansas City, Mo., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed Oct. 9, 1979, Ser. No. 82,718

Int. Cl.³ B02C *18/06*

U.S. Cl. 241—46 R **7 Claims**



1. A comminutor installation comprising:

a rectilinear-shaped comminutor chamber;

an inlet channel in flow communication with the comminutor chamber;

a rotary drum comminutor located in the chamber having the center of its drum offset with respect to the geometric center of the chamber;

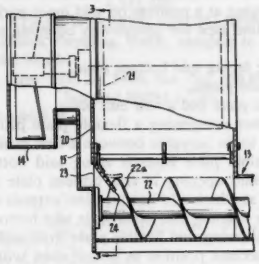
a receiving channel positioned under the comminutor to receive fluid passing vertically through the interior of the comminutor; and

an effluent channel in flow communication with the receiving channel.

4,311,282
AGRICULTURAL GRINDER MIXERS

Robert M. Howell, Glen Waverley, Australia, assignor to Sperry Corporation, New Holland, Pa.

Continuation of Ser. No. 62,392, Jul. 31, 1979, abandoned, Continuation of Ser. No. 62,392, Jul. 31, 1979, abandoned. This application Jan. 9, 1981, Ser. No. 223,598
Int. Cl.[3] B02C *13/286*
U.S. Cl. 241—56 4 Claims

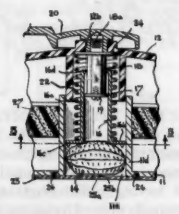


1. A grinder-mixer comprising:
means for processing grain by grinding said grain to produce milled material, said milled material containing dust and other airborne material, said means for processing including a hammermill;
a mixing tank portion of the grinder-mixer;
means for receiving and moving said milled material to said mixing tank, said means for receiving including an auger portion of the grinder-mixer connected adjacent the mill, said auger having rotatable flights;
means for exhausting said dust from said milled material in said auger portion to atmosphere, said means including an exhaust fan connected in an exhaust duct, said duct having a mouth adjacent said auger; said
means for dislodging said dust from said mouth, said means including a flap having a stationary first portion mounted adjacent said mouth and a second portion movable relative to said mouth in response to rotation of said auger causing repetitive engagement with said rotating auger flights.

4,311,283
CONDIMENT GRATER

William E. Bounds, P. O. Box 1547, Torrance, Calif. 90505

Filed Jul. 18, 1980, Ser. No. 170,015
Int. Cl.[3] A47J *42/34*
U.S. Cl. 241—95 8 Claims

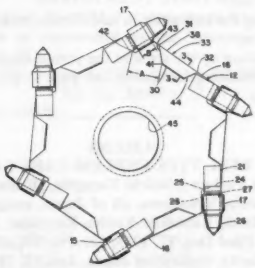


1. A grater for grating condiment comprising
a lower housing portion having an opening in the bottom thereof,
a blade member mounted in the opening of said lower housing portion,
said blade member including a pair of end-to-end longitudinal blades, one of said blades having a straight edge, the other of said blades having a serrated edge,
a cover member removably fitted onto said lower housing portion, a compartment being formed between said cover member and said lower housing portion for storing condiment,
a holder member for retaining the condiment while it is being grated, said holder member include means on the bottom thereof for removably retaining the condiment to the holder member,
a manual crank mechanism,
means for rotatably supporting said crank mechanism on said cover member,
means for coupling said crank mechanism to said holder member in driving engagement therewith, and
means for urging said holder member axially away from said cover member with the condiment retained thereby in engagement with the blade means,
whereby when the crank mechanism is rotated, the condiment is driven against the edges of the longitudinal blades and grated thereby, the serrated edge forming lands and grooves in the condiment and said straight edge shaving off the lands leaving a smooth surface for the next cut of the serrated edge.

4,311,284
DEVICE FOR FRACTURING MATERIAL

Edward H. Ratcliff, Jr., Millersburg, Ky., assignor to The W. R. Stamler Corporation, Millersburg, Ky.

Filed Feb. 8, 1980, Ser. No. 112,810
Int. Cl.[3] B02C *13/28*
U.S. Cl. 241—191 18 Claims



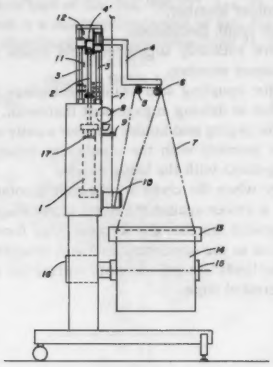
1. A device for fracturing an aggregate type of material including:
a ring rotatable relative to the material to be fractured;
said ring having a plurality of angularly spaced bits mounted thereon around its periphery for contacting the material when said ring is rotated relative to the material to fracture the material;
said ring having a bit holder for each of said bits;
said ring having a plurality of cut out portions in its periphery, each of said cut out portions having one of said bit holders disposed therein;
said ring having fracturing means between each adjacent pair of said bits to aid in fracturing the material during rotation of said ring;
said ring having a recess in its periphery between each adjacent pair of said bits;
each of said fracturing means including an insert disposed in one of said recesses in said ring and secured to said ring;
and each of said inserts including material engaging means to fracture the material.

4,311,285

YARN WINDING METHOD AND APPARATUS TO MAINTAIN TENSION DURING TAIL FORMATION

Frank L. Peckinpaugh, and Kenneth R. Benton, Sr., both of Colonial Heights, Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jul. 7, 1980, Ser. No. 166,001
Int. Cl.³ B65H *54/02, 59/00*
U.S. Cl. 242—18 PW **12 Claims**



1. The method for maintaining tension during tail formation of yarn on a winder comprising

setting the lash point of the yarn path to the winder at a position closer to the winder during string-up of the winder, then

moving the lash point to a position farther from the winder in a quick controlled manner at the time fail formation begins, and

maintaining the lash point in said farther position during tail formation,

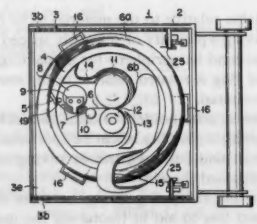
thereby taking up the slack in the yarn during tail formation and maintaining tension on the yarn to prevent breaking the yarn.

4,311,286

FIXED REEL TYPE ENDLESS TAPE CASSETTE

Morio Akino, Fujisawa; Seiichi Yanagida, Hiratsuka, and Hiroshi Yamashita, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 17, 1979, Ser. No. 104,455
Claims priority, application Japan, Jan. 18, 1978, 53-3800
Int. Cl.³ B65H *17/48;* **G11B** *23/10*
U.S. Cl. 242—55.19 A **11 Claims**



1. An endless tape cassette to be loaded for driving an endless tape accomodated therein on a tape drive system having a tape drive mechanism and a tape support mechanism for supporting said endless tape cassette such that the tape is driven by the tape drive mechanism, comprising:

a stationary reel having a communicating path communicating inner and outer peripheral sides thereof and carrying the endless tape wound on the outer peripheral side;

guide means for guiding the endless tape wound on said stationary reel such that it is pulled out from the inner peripheral side of the wound tape through said communicating path and taken up on the outer peripheral side of said wound tape;

a housing accommodating and supporting said stationary reel and said guide means, wherein the housing comprises:

a bottom plate formed with an opening for permitting said tape drive mechanism to be inserted therethrough into said housing at a position on said inner peripheral side of said wound tape for operatively coupling to said endless tape,

a top plate facing said bottom plate,

a pair of side plates,

a front end plate and a rear end plate,

a lid member comprising a flexible plate provided on said housing to be movable between a first position at which said flexible plate extends along said bottom plate for closing said opening in said bottom plate and a second position at which said flexible plate extends along said top plate for opening said opening in said bottom plate; and

means for moving said flexible plate from said first position to said second position in cooperation with the support mechanism when said housing is supported by said support mechanism, wherein said moving means comprises:

a first engaging member located on a tip edge portion of said flexible plate, and

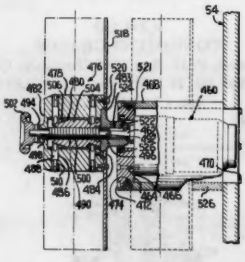
a second engaging member pivotally mounted on a front edge portion of said support mechanism to engage said first engaging member when said housing is initally inserted into said support mechanism and to allow forward movement of said housing within said support mechanism and relative movement of said flexible plate toward said second position upon further insertion of said housing into said support mechanism.

4,311,287

WEB PAY-OUT ASSEMBLY

Jack R. Evers, Los Angeles, Calif., assignor to Developak Corporation, Redondo Beach, Calif.

Filed Sep. 17, 1979, Ser. No. 76,454
Int. Cl.³ B65H *75/24*
U.S. Cl. 242—68.3 **10 Claims**



1. A web pay-out assembly comprising a hub for receiving a spool having a tubular core, said hub being hollow to define an interior chamber and having radial bores extending therethrough in circumferentially spaced relation, spool anchoring pins in said bores and having inner ends extending into said hub chamber, resilient means resisting radial outward movement of said pins, and cam means within said hub chamber and engaging said pin inner ends for forcing outer ends of said pins outwardly beyond said hub to engage a spool case, said cam means including a nut having a tapered external cam surface aligned with said pins, and a threaded positioning member axially fixed within said hub chamber and being rotatable to

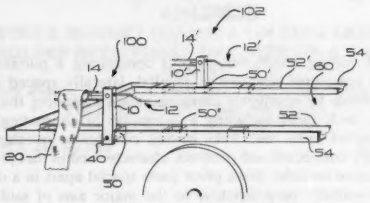
axially shift said nut to radially position said pins, said hub having flanges at opposite ends axially closing said hub chamber, and said positioning member having end portions rotatably journalled in said flanges, said flanges forming abutment means engageable with a central portion of said positioning member with said positioning member axially reacting against said flanges to effect said axial fixing of said positioning member.

4,311,288

STRAP WINDING MECHANISM

Gerald D. Galland, Puyallup, Wash., assignor to Jerry H. Webster, Seattle, Wash.

Filed Nov. 24, 1980, Ser. No. 209,994
Int. Cl.³ B65H *17/46*
U.S. Cl. 242—86.5 R **8 Claims**



1. A strap winding mechanism for use in connection with a conventional flat bed truck or the like provided with stake holes or the like along the sides thereof, said mechanism comprising:

an elongate stanchion, provided at the lower end thereof with mounting means for engagement with a selected stake hole of the truck bed with the stanchion arranged generally vertically above and at the side of the truck bed;

a plurality of journal apertures through the upper end of said stanchion at various azimithul attitudes with respect to the mounting means at the lower end of the stanchion;

a strap reel assembly comprising a reel hub and, extending therefrom, an open-ended bifurcated section on which the strap is windable and from which wound strapping is readily removable by withdrawal from the open end of such section;

a reel handle connected to said strap reel assembly by threaded connector means, with said reel handle and strap reel assembly being arranged on opposing sides of said stanchion in a selected journal aperture of said stanchion and with said threaded connector means enabling ready disassembly of the strap reel assembly from the reel handle for placement in any selected journal aperture in either direction for convenience of use of the mechanism and enabling ready disassembly of the reel handle, strap reel assembly and stanchion for storage of the mechanism when not in use.

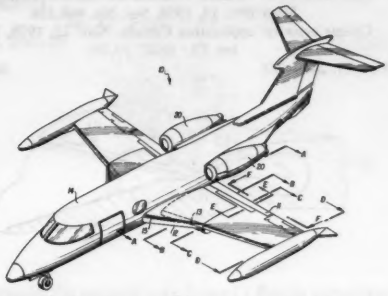
4,311,289

MODIFICATIONS TO JET AIRCRAFT HAVING AFT FUSELAGE-MOUNTED NACELLES OVERLAPPING THE WING ASSEMBLIES

Thomas Finch, San Antonio, Tex., assignor to The Dee Howard Company, San Antonio, Tex.

Filed Sep. 11, 1978, Ser. No. 941,349
Int. Cl.³ B64D *27/02*; B64C *3/10*
U.S. Cl. 244—55 **49 Claims**

1. In a jet aircraft of the type having aft fuselage-mounted engine nacelles partially overlapping trailing edge portions of the aircraft's wings, said jet aircraft being capable of flight in the transonic regime and including a channel on either side of the aircraft defined by said trailing edge portion of said wing, the aircraft fuselage, a pylon support assembly extending between said fuselage and said nacelle, a surface of said nacelle overlapping said wing, and an imaginary plane of symmetry extending from a lower-most outer surface of said nacelle into perpendicular contact with said wing, the improvement comprising:



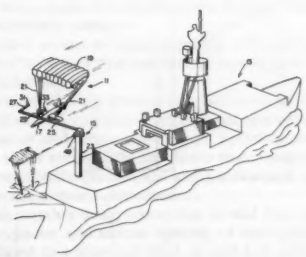
channel means having an area ratio of cross-sectional area at the channel exit to the minimum cross-sectional area at a position within said channel, said area ratio being less than or equal to 1:1.065 for preventing the formation of shock waves in said channel during transonic flight of said aircraft.

4,311,290

ARRESTMENT SYSTEM

Kenneth T. Koper, Hatfield, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 1, 1979, Ser. No. 90,205
Int. Cl.³ B64F *1/02*
U.S. Cl. 244—110 R **9 Claims**



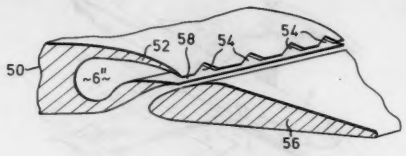
1. Apparatus for arrestment on a vessel of an aircraft in flight having a parafoil connected to it by shroud lines from the body of the aircraft, comprising:

support means formed to be uprightly mounted on the vessel;

engaging means pivotally connected to said support means and radially extending therefrom for pivoting downwardly and about said support means upon capturing the shroud lines; and

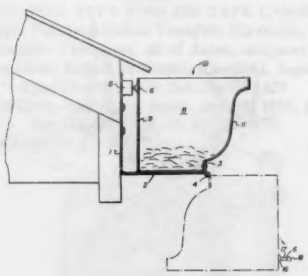
adjustable braking means operatively connected between said support means and said engaging means for providing a constant force for stopping the aircraft within a predetermined sector of pivoting of said engaging means about said support means.

4,311,291
NOZZLE STRUCTURE WITH NOTCHES
Frederick L. Gilbertson; Douglas B. Garland, and Donald C. Whittley, all of Toronto, Canada, assignors to The De Havilland Aircraft of Canada, Limited, Downsview, Canada
Filed Dec. 11, 1978, Ser. No. 968,226
Claims priority, application Canada, Nov. 22, 1978, 316697
Int. Cl.³ B64C *21/04*
U.S. Cl. 244—211 **24 Claims**



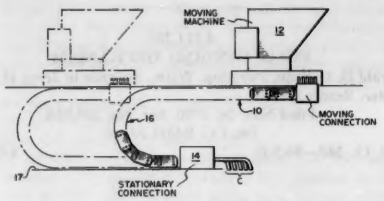
1. In an aircraft, a lift and/or propulsion system for said aircraft, said system comprising: supply means for supplying pressurized gas, a nozzle connected with said supply means for receiving said gas and producing a jet stream, said nozzle having a nozzle exit surface having a rear edge, said rear edge having a plurality of notches formed therein and spaced along said rear edge for spreading said jet stream while directing said jet stream rearwardly of said nozzle, each notch having a narrow front apex and a rear opening substantially wider than said apex and each notch widening substantially smoothly and progressively from its apex to its rear opening, each said notch having sides which at least over a major portion of their length diverge from each other at an angle which is at least 60 degrees, said rear edge having a narrow elongated slot therein, said notches being located in at least one side of said slot.

4,311,292
GUTTER ATTACHMENT
Paul K. Deason, 634 Chuck Gray Ct., Owensboro, Ky. 42301
Filed Mar. 13, 1980, Ser. No. 129,844
Int. Cl.³ E04D *13/06*
U.S. Cl. 248—48.2 **2 Claims**



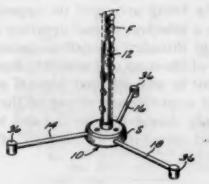
1. A gutter support bracket which allows the gutter to rotate about a point and therefore clean the gutter of accumulated debris comprising an L-shaped bracket member having a vertical leg affixed to the wall of the building directly underneath the roof and a horizontal leg extending outwardly therefrom, pivot means disposed on the horizontal leg at an extremiter remote from the vertical leg, latching means disposed on the vertical leg and on the gutter to fasten said vertical leg to the gutter and in which said latching means comprises a block latch disposed on a vertical leg of the bracket having means defining an opening on a face of said latch proximate to the gutter and a pop rivet disposed on a wall of the gutter in registry with the hole on said latch.

4,311,293
ROLLING CONDUCTOR SUPPORTS
David M. Tenniswood, Troy, Mich., assignor to McGraw-Edison Company, Rolling Meadows, Ill.
Filed Jul. 9, 1979, Ser. No. 56,006
Int. Cl.³ F16L *3/00*
U.S. Cl. 248—49 **17 Claims**



1. A rolling conductor support comprising a plurality of chains connected together in parallel, laterally spaced apart relationship by conductor carrying means extending therebetween, each chain including a succession of alternating first and second links, said links having contiguous overlapping pivotally connected end portions, characterized in that pivotal connection includes three pivot parts spaced apart in a direction essentially perpendicular to the major axis of said first links, extending laterally between and connecting together the overlapping end portions of said links, one of said pivot parts providing a fulcrum for pivotal movement between the links, said second links having at each overlapping end portion thereof two slots of predetermined arcuate length measured in relation to said fulcrum pivot part, and the other two pivot parts interfitting in said slots and fixed to each overlapping end portion of said first link and moveable in the slots to the arcuate lengths thereof to limit pivotal movement between the links, whereby successive links fulcrum about said pivot part, and are limited in pivotal movement by said slots.

4,311,294
FLUTE OR PICCOLO STAND
Ronald E. Hawley, 1117 Tower Dr., Vista, Calif. 92083
Filed Jul. 3, 1980, Ser. No. 165,757
Int. Cl.³ F16M *11/32*
U.S. Cl. 248—165 **1 Claim**



1. A portable collapsable flute or piccolo stand, comprising:
a base formed with an open topped recess, a vertically extending threaded bore coaxial with said recess, and a plurality of upward-opening blind passages;
a plurality of generally horizontally extending passages that radiate axially from said recess with the upper part of their radially inner portions coinciding with the bottom of said recess;
a resilient washer disposed in said recess;
a plurality of legs each having its inner portion removably slidably received within one of said horizontally extending passages;
a center post having a threaded stud depending from its underside, said stud being threadably engagable with the threaded bore of said base; and

pressure-applying means consisting of a generally cylindrical pressure pad formed with a coaxial bore through which extends said stud interposed between the underside of said post and said washer whereby downward rotational movement of said post will cause said washer to exert a downward locking force on the radially inner portions of said legs, and with said blind passages removably snugly receiving the inner portions of said legs when said stand is collapsed.

4,311,295

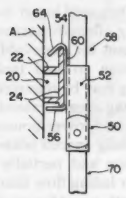
ARTICLE SUPPORT HAVING A LOCKING ARTICLE HOLDER DETACHABLY MOUNTED ON A WALL MOUNT

Walker Jamar, Jr., 365 S. First Ave., E., Duluth, Minn. 55802

Filed Oct. 19, 1979, Ser. No. 86,431

Int. Cl.³ E04G *5/06*; F16L *3/08*

U.S. Cl. 248—221.3 **9 Claims**



1. An article holder for pictures, displays and the like, means detachably mounting the same on a wall, a wall mount adapted to be secured to a wall having a support member disposed in close but spaced relationship to the wall and defining first and second support surfaces, said holder comprising a body portion; a hook portion connected to said body portion for pivotably engaging a first one of the support member support surfaces and preventing removal of said holder from the wall mount by transverse outward movement of said holder; a leg portion connected to said body portion for allowing said holder to be removed from the wall mount by vertical movement thereof when said hook portion is operatively engaged with the support member and said holder is pivoted outwardly past a predetermined position such that said body portion is inclined at an angle with respect to the vertical and said leg portion does not overlie the support member, and for preventing vertical movement of said holder which would operatively disengage said hook portion from the support member when said hook portion is operatively engaged with the support member and said holder is pivoted inwardly past said predetermined position, such that said leg portion overlies the support member and cooperates with a second one of the support member support surfaces; and locking means comprising at least one elongated member and means for slidably mounting said member to said body portion such that said locking means may be displaced from a first position, wherein said holder may be pivoted outwardly beyond said predetermined holder position when said hook portion is operatively engaged with the support member, to a second position, wherein abutment of said locking means with the wall prevents said holder from being pivoted outwardly beyond predetermined holder position when said hook portion is operatively engaged with the support member.

4,311,296

CARTRIDGE ELEMENT CONTROL

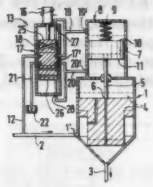
Gerd Scheffel, 4052 Korschenbroich 1, Fed. Rep. of Germany

Filed Aug. 14, 1979, Ser. No. 66,392

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1978, 2835771

Int. Cl.³ F16K *31/02, 31/122*

U.S. Cl. 251—29 **9 Claims**



1. A system for regulating the flow of a fluid in dependence of an input signal,

comprising in combination:

a valve housing including a fluid-pressure expansible chamber and having an inlet for receiving a fluid from a main conduit, and an outlet for discharging the fluid,

main valve means adjustably positionable between said inlet and said outlet defining an adjustable passage upstream of said outlet to control the rate of flow of the fluid discharged from said outlet, said main valve means including a first passage for transferring the fluid from the main conduit into said expansible chamber for closing said main valve means

a cylinder substantially closed off from said valve housing,

a piston valve means in driving connection with said main valve means and being movable within said cylinder in opposite valve closing and valve opening directions, said cylinder having a first opening disposed on one side of said piston valve means, and a second opening disposed on the other side of said piston valve means for fluid to pass therethrough, the fluid on said one side of said piston valve means exerting a first pressure on said one side, the fluid on the other side of the piston valve means exerting a second pressure on said other side,

resilient means urging said piston valve means to close said main valve means for throttling the flow of fluid through said adjustable passage,

fluid control means in communication with said main conduit and with said first and second openings of the cylinder comprising:

a fluid switch, having first and second active stations, and a neutral station, said fluid switch, when operative, occupying one of said active stations, and including a container, and a slider reciprocally slidable in said container along a predetermined direction, and along a direction opposite to said predetermined direction,

said main conduit being connected to said first opening of said cylinder, said second opening of said cylinder being connected to a source of fluid, in said first active station,

said main conduit being connected to said second opening of said cylinder, said first opening being connected to the source of fluid, in said second active station,

fluid transmission to said first and second openings being blocked in said neutral station,

magnetic means controlled by said input signal for exerting a force on said slider in dependence of said input signal, and

means for transmitting any pressure differential between said first and second fluid pressures to said fluid switch so as to oppose the force of said magnetic means, whereby the fluid switch is changed from a corresponding one of said active stations to said neutral station upon said first pressure equalling said second pressure, so as to enable said piston valve means to expell the fluid from the expansible

chamber through a second passage in said main valve means to control said main valve means to regulate the outflow of said fluid through said adjustable passage, the cross-section of of said passage being proportional to said input signal.

4,311,297

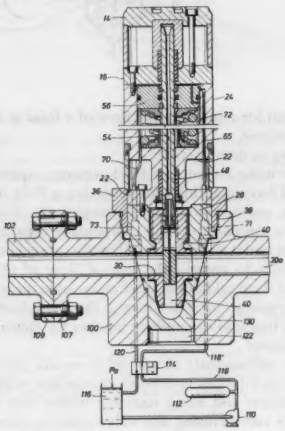
PRESSURE INSENSITIVE VALVE

Claud C. Barrington, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Apr. 4, 1980, Ser. No. 137,187

Int. Cl.³ F16K *31/126*

U.S. Cl. 251—63.6 **9 Claims**



4. A subsea valve apparatus insensitive to ambient hydrostatic pressure and used to control the flow of fluid in a pipe, which apparatus comprises:

a valve body capable of being remotely engagable with said pipe and forming a first chamber;

a housing attached at one end to said valve body, said housing forming a second chamber at the other end;

a valve element supported by said valve body within said first chamber and capable of advancing across said pipe to control the flow of fluid in said pipe;

a valve stem attached to said valve element and supported within said housing, said valve stem extending from said valve element in said first chamber to said second chamber, said valve stem having a passageway extending therethrough providing fluid communication between said first and second chambers so that pressure force on one end of said valve stem being introduced from said pipe said first chamber is substantially the same as the pressure force on the opposite end of said valve stem in said second chamber thereby balancing the influence of the pipe pressure on both ends of said valve stem;

means for reciprocating said valve element across said pipe, said reciprocating means comprises:

an annular piston positioned around said valve stem,

spring means circumscribing said valve stem and supported within said cylindrical member, and

means for pressurizing against one side of said piston to advance said piston against the force of said spring means by providing a force greater than the force of said spring means thereby advancing said valve element across said pipe; and

equalizing means capable of balancing ambient pressure on both sides of said piston to eliminate the influence of hydrostatic pressure on the operation of said valve and capable of eliminating the influence of hydrostatic pressure on said housing at substantially the same time.

4,311,298

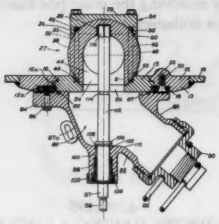
LOW PROFILE TANK CAR BALL VALVE

Edwin S. Carlson, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Mar. 26, 1980, Ser. No. 134,050

Int. Cl.³ F16K *5/06, 27/00*

U.S. Cl. 251—144 **10 Claims**



1. A bottom operable tank lading valve assembly comprising: a tank car mounting flange located within a tank opening in the tank bottom and connected to the tank bottom; a valve housing located within an opening in the mounting flange; said housing extending up into the tank body; said housing being split upon a horizontal plane into an upper housing portion and a lower housing portion; said lower housing portion having an outwardly extending flange portion which engages said mounting flange; means for removably connecting said lower housing flange portion to said tank car mounting flange whereby said housing may be removed from the bottom of the tank; housing fastening means extending between said upper housing portion and said lower housing portion; said housing having a pair of laterally spaced ports formed partially in said upper housing portion and partially in said lower housing portion to provide for lading flow into the housing; a ball valve rotatably mounted within said housing and extending into both said upper housing portion and said lower housing portion; said ball having a pair of side openings which in open position align with said housing ports; said ball having wall portions which in closed position close said housing ports and prevent lading from entering the housing; said ball valve side openings being in fluid communication with a bottom ball valve opening which aligns with a discharge opening in said lower housing portion; sealing means extending vertically in both said upper housing portion and said lower housing portion to seal said ball valve in closed position relative to said tank; a lower ball valve operator extending upwardly through said bottom ball valve opening; drive means connecting said lower operator to said ball valve whereby rotation of said operator will rotate said ball valve and move the same between open and closed positions so that in open position lading can flow through said housing ports, through said ball valve side openings and out of the tank through said bottom valve opening.

4,311,299

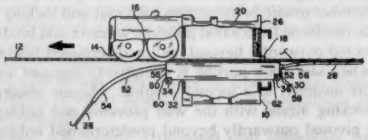
CABLE LASHER

Alton D. Elliott, Jr., P. O. Box 147, Guntersville, Ala. 35976

Filed Feb. 2, 1981, Ser. No. 230,627

Int. Cl.³ E21C *29/16*

U.S. Cl. 254—134.3 CL **5 Claims**



1. A system comprising:

a cable lasher supportable for movement along a support cable, and said lasher including;

an elongated cavity extending from end to end of said lasher, and through which the support cable is positionable, and

an openable gate member at each end of said lasher, a said openable gate member normally, when closed, extending across an end of said lasher, and when opened, being positioned in a direction which does not extend across said opening, whereby vertical access upward to the lasher and said cavity is unimpeded;

a housing supportable in said cavity by said openable gate members when closed;

said housing including at least one tubular passageway generally parallel to said support cable through said cavity; and

a bendable tubular member forming an extension of said passageway at one end, the forward end, of said lasher.

4,311,300

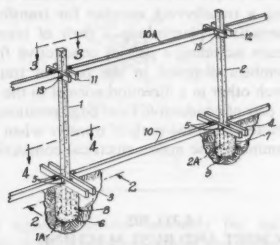
POST FOOTING BRACING AND SPACING APPARATUS

Eddy C. Buerger, 1077 Dorothy St., El Cajon, Calif. 92020

Filed Oct. 31, 1980, Ser. No. 202,633

Int. Cl.³ E04H *17/00*

U.S. Cl. 256—1 **2 Claims**



1. In the construction of fences and the like, an apparatus for accurately spacing a first post relative to a second post which comprises:

at least one securing means mounted on the first post;

at least one securing means mounted on the second post;

at least one space bar joining a securing means on the first post to a securing means on the second post;

said securing means comprising first and second crossbars held parallel and distal to one another;

means for adjustably connecting said crossbars in a clamping arrangement on opposite sides of one of said posts; and

means on at least one of said cross bars for connecting with said space bar.

4,311,301

GUIDE TROUGH FOR MOLTEN PRODUCTS

Tamio Okada, Warabi, and Toshiaki Sano, Tokyo, both of Japan, assignors to Nippon Crucible Co., Ltd., Tokyo, Japan

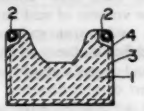
PCT No. PCT/JP79/00016, § 371 Date Sep. 26, 1979, § 102(e) Date Sep. 26, 1979, PCT Pub. No. WO79/00550, PCT Pub. Date Aug. 23, 1979

PCT Filed Jan. 25, 1979, Ser. No. 159,224

Int. Cl.³ F27D *3/14*

U.S. Cl. 266—196 **5 Claims**

1. A guide trough for molten products, comprising a long body made of monolithic refractory material and provided with a runway for conducting molten products in the top surface thereof; supporting means for supporting said body, said supporting means comprising a couple of holding beams embedded longitudinally in the upper portions of said trough body one on each side thereof, supporting cross-members, and said holding beams being connected by said supporting cross members longitudinally spaced apart and extending across the bottom of said trough body; and hook engaging means provided on said holding beams for engaging a hook, each of said



hook engaging means having sufficient space formed around said holding beams so as to expose a part of said holding beams for engagement with a hook.

4,311,302

SHOCK ABSORBER DEVICE

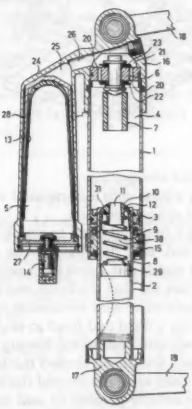
Günther Heyer; Karl Kany; Paul Spichala; Felix Wössner, and Wilhelm Wecker, all of Schweinfurt, Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Dec. 19, 1979, Ser. No. 105,092

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2855561

Int. Cl.³ F16F *5/00*; B60G *15/08*

U.S. Cl. 267—64.23 **57 Claims**



1. A shock absorber device comprising an axially elongated cylindrical member having a first end and a second end spaced apart in the axial direction thereof, a piston rod unit including an axially elongated piston rod extending into said cylindrical member through the first end thereof, said piston rod extending outwardly from the first end of said cylindrical member, said piston rod being movable in the axial direction of said cylindrical member between a first end position where the minimum axial length of said piston rod extends through the first end into said cylindrical member and a second end position where the maximum axial length of said piston rod extends through said first end into said cylindrical member toward said second end thereof, said cylindrical member forming a variable volume working chamber therein with the volume depending on the position of said piston rod between the first and second end positions, a spring chamber, means for forming a flow passageway connecting said spring chamber to said working chamber in said cylindrical member, said working chamber and said spring chamber being arranged to hold a body of a first fluid which fills said working chamber and partially fills said spring chamber, means in said spring chamber arranged to be contacted by the first fluid for transmitting pressure to the first fluid in said spring chamber and therefrom to said working

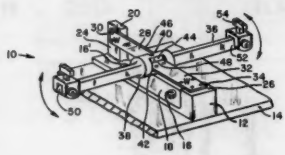
chamber for biasing said piston rod toward the first end of said cylindrical member, means for forming at least a part of a damping chamber in fluid flow communication with said working chamber the volume of said damping chamber being reduced only when said piston rod passes an intermediate position between said first and second end positions in moving toward said second end of said cylindrical member, said means forming at least a part of said damping chamber arranged to form at least in part a throttled passageway communicating between said working chamber and said damping chamber so that a throttled flow of the first fluid flows from said damping chamber into said working chamber only when said piston rod passes said intermediate position between said first and second end position in moving toward the second end of said cylindrical member.

4,311,303

FLEXURAL PIVOT MEMBER

William E. Nave, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed May 12, 1980, Ser. No. 149,066
Int. Cl.³ F16F *1/26*
U.S. Cl. 267—160 **8 Claims**



1. A flexural piviot comprising:

a housing having a base with a horizontal support separated from a vertical support surface;

a first bar having a first end fixed to said horizontal support and a second end, said first bar having a cross sectional shape of a first width and a first thickness, said first width being greater than the first thickness and located in a plane substantially parallel to said horizontal support;

a second bar having a third end fixed to said vertical support and a fourth end, said second bar having a cross sectional shape of a second width and second thickness, said second width being greater than the second thickness and located in a plane substantially parallel to said vertical support;

a lever arm having an input end separated from an output end by a fulcrum created by fixing the second and fourth ends of the first and second bars, respectively, to the lever arm, said input end receiving an input force, said first width of the first bar and the second width of the second bar holding the fulcrum in a substantially fixed position with respect to the horizontal and vertical support surfaces to allow the input force to rotate the lever in a plane perpendicular to said first and second bars and provide said output end with angular movement corresponding to a twisting moment in the first and second bars.

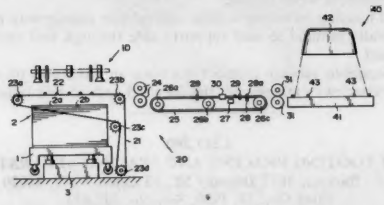
4,311,304

PRESENSITIZED PLATE HANDLING DEVICE

Shinji Hamada, and Masaru Imai, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 25, 1979, Ser. No. 78,846
Claims priority, application Japan, Sep. 29, 1978, 53-133958[U]; Oct. 11, 1978, 53-139288[U]
Int. Cl.³ B65H *5/08*
U.S. Cl. 271—13 **8 Claims**

7. A presensitized plate handing device comprising a platform supporting thereon a stack of presensitized plates, a lifting means for lifting the platform so that the uppermost presensitized plate in the stack is always positioned at a predetermined level, a sucking and separating means which sucks and separates the uppermost presensitized plate away from the rest of the stack in which said sucking and separating means comprises (a) at least one sucker member which sucks portions of the uppermost presensitized plate, and (b) at least one holding member which holds the stack downward from above the uppermost presensitized plate at portions adjacent to the portions sucked by the sucker member, the sucker member and the holding member being moved upward in this order when separating the uppermost presensitized plate from the rest of



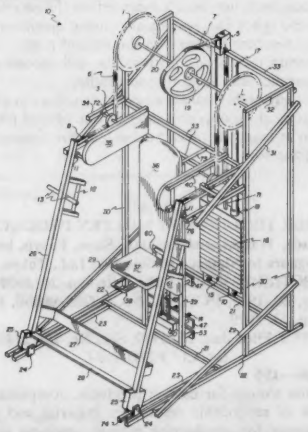
the stack, said presensitized plate comprising an aluminum base and a photosensitive layer carried thereon and said transferring means including a transferring member for transferring the separated presensitized plate along a path of transfer, and positioning means including a pair of conductive front edge positioning members disposed in the path of transfer and aligned with each other in a direction normal to the direction of transfer, the pair of conductive front edge positioning members being retracted from the path of transfer when the front edge of the aluminum base makes electrical connection therebetween.

4,311,305

CHEST AND BUST MACHINE

Lloyd J. Lambert, Jr., and Lloyd J. Lambert, Sr., both of 1538 College Ave., South Houston, Tex. 77587

Filed Dec. 4, 1979, Ser. No. 100,177
Int. Cl.³ A63B *23/02*
U.S. Cl. 272—118 **10 Claims**



1. An improved chest and bust exercise machine comprising in combination: a framework comprising a base frame having a plurality of horizontal, floor engaging frame members, a plurality of upwardly extending frame members emanating vertically from said horizontal, floor engaging frame members, a

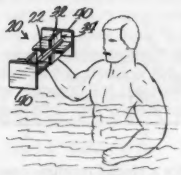
plurality of upwardly extending frame members, a pair of said vertical frame members constituting support rods, a vertical back support fastened to said pair of support rods, a substantially horizontal seat supported by said pair of support rods, said seat extending outwardly from said back support and being provided with means for adjusting the height of said seat, a pair of spaced parallel pivot arms having means pivotally attaching their lowermost extremity to a pair of said horizontal frame members so that each of said pivot arms extends forwardly of and on opposed sides of said back support and seat, said pivotal attaching means being disposed such that the rotative movement of said pivot arms is in spaced vertical planes forwardly of said back support and seat, and weight means attached to said pivot arms at each of their respective upper extremity and to at least the upper portion of said framework to provide a direct drive mechanism so that a user positioned on said back support and seat will rotate the pivot arms outwardly therefrom thereby providing chest and bust development on a direct drive basis.

4,311,306

AQUATIC EXERCISE ASSEMBLY

Daniel S. Solloway, 1315 18th St., Woodward, Okla. 73801

Filed Sep. 28, 1979, Ser. No. 79,966
Int. Cl.³ A63B *21/00*; B63B *11/00*
U.S. Cl. 272—130 **7 Claims**



1. An aquatic exercise assembly for use in water to strengthen muscles, improve muscle tone and enhance muscular coordination, comprising:

a generally impact-resistant water-engageable shaft formed of substantially water-impermeable material having fin-supporting end portions and a manually grippable portion for being grasped under water extending between said fin-supporting end portions, said shaft being elongated and extending in an axial direction along an axis, said manually grippable portion of said shaft having a maximum width defining a thickness taken in a radial direction generally transverse to said axis and said shaft being movable in said water; and

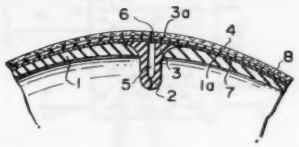
a plurality of water-engageable fins providing a hydrodynamic resistance assembly secured to and extending radially from each of said fin-supporting end portions of said shaft, said fins being substantially rigid to substantially avoid radial deflection and being angularly disposed with respect to each other for deflecting water and creating a pressure head and fluid resistance to water flow as said shaft is moved in said water, each of said fins having a shaft-engaging portion extending the entire axial length of each fin and having a height extending from said shaft-engaging portion to an outer extremity of said fin substantially greater than the maximum thickness of said manually grippable portion of said shaft for enhanced hydrodynamic resistance, each of said fins having a solid, generally planar water-impingement surface lying in the axial direction and extending continuously across said fin from said shaft-engaging portion to said outer extremity with an imperforate, water-impervious cross-sectional area to provide a solid barrier in coplanar relationship and alignment with said axis to hydrodynamically engage said water, and said rigid fins being spaced an effective distance from said manually grippable portion of said shaft for exerting a hydrodynamic torque on said manually grippable portion of said shaft as said shaft is being moved in said water to strengthen the muscles of the user of the exercise assembly.

4,311,307

BALLS FOR SPORTS

Masato Mizuno, Tokyo, Japan, assignor to Mizuno Corporation, Osaka, Japan

Filed Dec. 27, 1979, Ser. No. 107,606
Claims priority, application Japan, Dec. 29, 1978, 53/183037[U]
Int. Cl.³ A63B *41/00*
U.S. Cl. 273—65 B **3 Claims**



1. A pneumatic ball comprising a rubber bladder fitted with a valve having an air passage therethrough and a plurality of outer layers covering the rubber bladder,

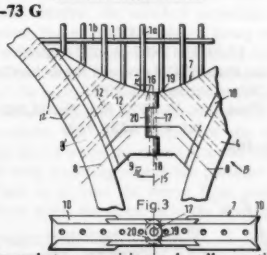
wherein the upper end surface of the valve is flush with the outer surface of the bladder and is covered with said outer layers, which outer layers include a yarn-winding layer, a rubber cushion layer and a skin layer and wherein said outer layers are provided with an aperture extending through the outer layers, immediately above said air passage of the valve.

4,311,308

TENNIS RACKET

Franz Völkl; Günter Adam, and Volker Klose, all of Straubing, Fed. Rep. of Germany, assignors to Franz Völkl OHG, Straubing, Fed. Rep. of Germany

Filed May 31, 1979, Ser. No. 44,336
Int. Cl.³ A63B *49/02*
U.S. Cl. 273—73 G **9 Claims**

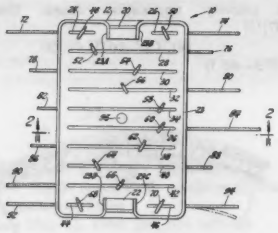


1. A tennis racket, comprising a handle portion; a frame portion adapted to have string mounted therein; a throat portion connecting the handle and frame portion; an insert in said throat portion connected to the same and adapted to have secured thereto at least some of a plurality of strings normally mounted in said frame portion; and means for permitting said insert to undergo elastic yielding in direction substantially normal to the general plane of said frame portion in response to the impact of a ball onto said strings and consequent transmission of the impact stress from said strings to said insert, said permitting means including at least one hinge unit having a hinge axis coinciding with an axis of symmetry of the tennis racket, wherein said insert being of two pieces and said one hinge unit including a shaft element operative for movably connecting said pieces of the insert so that said pieces may pivot relative to each other on said shaft in response to the impact stresses from said strings to said insert.

4,311,309
TABLE TOP HOCKEY GAME

Philip E. Bradley, 2651 Point Tremble Rd., Algonac, Mich. 48001, and Gordon Valentine, 18244 Woodbine, Detroit, Mich. 48219

Filed Mar. 11, 1980, Ser. No. 129,226
Int. Cl.[3] A63F *7/10, 7/06*
U.S. Cl. 273—85 B 9 Claims

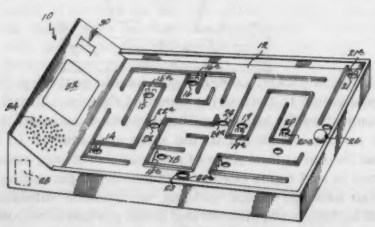


1. A game comprising:
a generally horizontal playing surface having opposite ends and sides;
a pair of spaced goals at opposite ends of said playing surface;
said playing surface having twelve generally parallel slots extending transversely to a line between said goals, four of said slots being disposed each between one of said goals and a side edge of said playing surface;
a control rod axially and rotatably movably mounted vertically directly beneath each slot and extending axially parallel thereto;
a playing element positioned vertically directly above each slot; and
means for operatively connecting said playing element to said control rod, such that the playing element is movable along a line parallel to the associated slot and rotatably movable about an axis normal to the playing surface and intersecting said control rod in response to rotation of said control rod.

4,311,310
ELECTRONIC MAZE GAME

Scott Dankman; Richard C. Levy, and Bryan McCoy, all of 1001 Spring St., Silver Spring, Md. 20910

Filed Nov. 19, 1979, Ser. No. 95,368
Int. Cl.[3] A63F *9/06*
U.S. Cl. 273—109 15 Claims

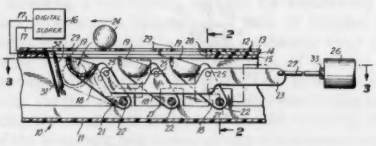


1. An electronic game comprising:
a game board adapted for cooperation with a playing piece, said playing piece being movable with respect to said board;
a plurality of controllably actuable visual indicia disposed on said board;
at least one switch means associated with each of said visual indicia, for generating, when enabled, an electrical goal signal in response to the presence of said game piece at a predetermined position on said board corresponding to said associated visual indicia;
actuation means, responsive to a code signal applied thereto, for enabling at least a particular one of said switch means as in accordance with said code signal and actuating the visual indicia associated with said particular one of said switch means;
pseudo-random generator means, for generating said code signal to said activation means and pseudo-randomly varying said code signal; and
counter means, cooperating with each of said respective switch means, and responsive to said goal signals for developing a count indicative of the number of times said goal signal is generated.

4,311,311
REPROJECTOR APPARATUS FOR PINBALL MACHINES

Dorland L. Crosman, Bloomfield, N.J., assignor to Louis Marx & Co., Inc., Stamford, Conn.

Continuation of Ser. No. 876,794, Feb. 10, 1978, abandoned. This application Oct. 22, 1979, Ser. No. 86,987
Int. Cl.[3] A63D *13/00*
U.S. Cl. 273—121 A 3 Claims



1. An apparatus for a pinball machine comprising an inclined playing surface adapted to have a ball roll thereon in a first linear direction, a support member positioned entirely below said playing surface, at least a pair of ball receiving members positioned entirely below said playing surface and pivoted on said support member for coplanar pivotal movement, said ball receiving members being in substantial alignment in said first linear direction, actuating means connecting said ball receiving members for moving said ball receiving members in unison in a first arcuate direction opposite said first linear direction, circuit means supported below said playing surface and operable in response to movement of said ball receiving members in unison in a second arcuate direction opposite said first arcuate direction to actuate said actuating means, and a ball receiving aperture in said playing surface associated with each said ball receiving member, said ball receiving members and said associated ball receiving apertures being spaced a distance such that actuation of said actuating means may cause a ball projected from one of said ball receiving members to be thrown so as to traverse said playing surface and be received in the other of said aligned ball receiving members, each said ball receiving member comprising an arm pivoted at one end to said support member and a cup at the other end of said arm into which said ball is adapted to fall through said ball receiving aperture.

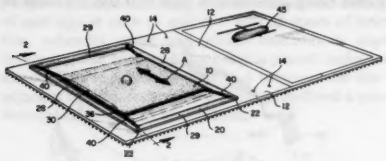
4,311,312
ELASTIC CORD SUSPENDED GOLF PRACTICE PAD

John P. O'Brien, 175 E. Delaware Pl., Chicago, Ill. 60611

Continuation-in-part of Ser. No. 35,605, Apr. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 932,563, Aug. 10, 1978, abandoned. This application Oct. 9, 1980, Ser. No. 195,403
Int. Cl.[3] A63B *69/36*
U.S. Cl. 273—195 A 12 Claims

1. A golf practice pad adapted to be disposed on a horizontal surface, said pad comprising a stationary, horizontal, rectangular frame; and a golf ball hitting surface resiliently positioned

within said frame; said frame comprising two side rails and two end rails, with said hitting surface disposed therebetween but spaced therefrom; resilient means adapted to maintain said hitting surface within said frame, said resilient means comprising a first resilient means connecting the front of said hitting surface to the adjacent frame; and a second resilient means



connecting the back of said hitting surface to the adjacent frame; said resilient means generally aligned with the direction of the line of flight of the golf ball to be struck from said hitting surface, and adapted to permit said hitting surface to slide horizontally over said horizontal surface within said frame when a golf ball is struck from the hitting surface and thereafter return said hitting surface to its original position.

4,311,313

CLEARANCE SEALING ARRANGEMENT FOR JET THRUST DEFLECTION EQUIPMENT

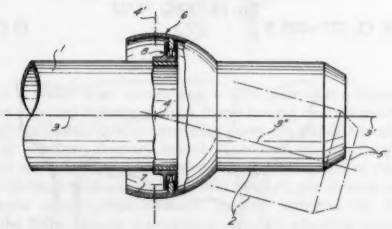
Ralph Vedova, Munich, and Alfred Jabs, Gröbenzell, both of Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 13, 1980, Ser. No. 206,423

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1979, 2946324

Int. Cl.³ F16J *15/16*

U.S. Cl. 277—27 **5 Claims**



1. A sealing arrangement for sealing the clearance between the outlet end of a rigidly mounted jet pipe and another pipe section tiltable three-dimensionally with respect to the rigidly mounted pipe, the two pipes being interconnected by a formation on one of the pipes having a ball socket-like inner surface, the sealing arrangement comprising:

(a) a ring-shaped seal support on the pipe not having the ball socket-like formation, the seal support being coaxial with its respective pipe, and the seal support opening toward the ball socket-like inner surface and having a base opposite the opening,

(b) a sealing ring accommodated within the seal support so as to be movable axially and radially therein, the sealing ring being formed of segments which overlap one another in the circumferential and axial directions, and the sealing ring protruding from the opening in the seal support,

(c) a flat spring between the sealing ring and seal support base, the spring being corrugated in the circumferential direction and being tangent alternately to the seal support base and to the sealing ring,

(d) internal pressure in the pipes, when the jet engine is running, pressing the segments of the sealing ring against both the ball socket-like inner surface and a wall of the seal support, and

(e) pressure equalizing pockets in the wall of the seal support against which the seal is pressed.

4,311,314

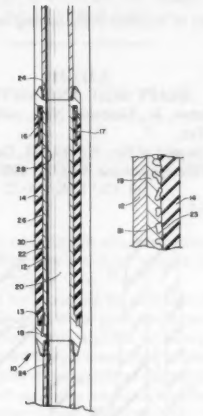
WELL PACKER

George O. Suman, 5420 Huckleberry La., Houston, Tex. 77056

Filed Nov. 20, 1980, Ser. No. 208,823

Int. Cl.³ F16L *33/16*

U.S. Cl. 277—34 **3 Claims**



1. An inflatable packer for use within the borehole of an oil well comprising: a centrally disposed tubular mandrel provided with end means for sealably attaching to a string of pipe; a tubular sleeve formed from a suitable elastomer and positioned around the mandrel, the mandrel extending out of the ends of the sleeve; the ends of the sleeve being sealably attached to the periphery of the mandrel; the sleeve having a first position wherein the sleeve inner surface is in contact with the outer surface of the mandrel; means to inflate the sleeve so as to expand the sleeve to a second position so as to seal the sleeve against the borehole; the outer surface of the mandrel in contact with the sleeve when the sleeve is in the first position, being provided with a coating of grit-like particles bonded to said outer surface to prevent the sleeve from sliding axially along the mandrel when the sleeve is in the first position.

4,311,315

SHAFT SEAL

Ernst A. Kronenberg, Basel, Switzerland, assignor to Sealing AG, Basel, Switzerland

Filed Dec. 17, 1979, Ser. No. 104,536

Claims priority, application Canada, Nov. 27, 1979, 340703

Int. Cl.³ F16J *15/32*

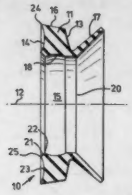
U.S. Cl. 277—95 **10 Claims**

1. A shaft seal of resiliently deformable elastomeric material, the seal comprising:

a seal body of annular form having a longitudinal axis and comprising an annular front face, an annular rear face, and an annular inner face;

and a frusto-conical sealing flange extending outwardly and

forwardly from the front face of the seal body adjacent the inner face thereof;



the inner face of the seal body having an annular concavity; and

the rear face of the seal body having an annular concavity.

4,311,316

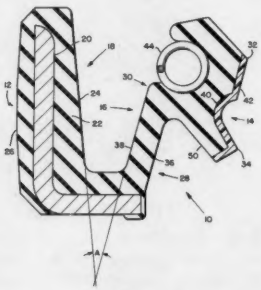
SHAFT SEAL AND METHOD

Douglas A. Cather, Jr., Gastonia, N.C., assignor to Garlock Inc., Longview, Tex.

Continuation-in-part of Ser. No. 89,281, Oct. 29, 1979, Pat. No. 4,274,641. This application Aug. 21, 1980, Ser. No. 179,957

Int. Cl.³ F16J *15/32*

U.S. Cl. 277—1 **24 Claims**



1. An annular shaft seal for sealing against the flow of fluid through an annular space between a bore of a housing and a shaft extending through the bore, comprising:

(a) an annular bore retention section;

(b) an annular sealing element which includes a primary sealing lip lined with low-friction material and a secondary sealing lip lined with low-friction material, said primary sealing lip being located axially inwardly of said secondary sealing lip and being adapted to sealingly contact a shaft extending through said seal; and

(c) an annular flex section connecting said bore retention section to said sealing element and adapted to allow said sealing element to move freely radially with a shaft and relative to said bore retention section, said flex section including an axial flex section and a radial flex section.

4,311,317

LIP AND RADIAL SEAL

Harold U. Bartels, 2729 Harrison, Riverside, Calif. 92503

Filed Aug. 20, 1979, Ser. No. 68,245

Int. Cl.³ F16J *15/10*

U.S. Cl. 277—212 C **15 Claims**

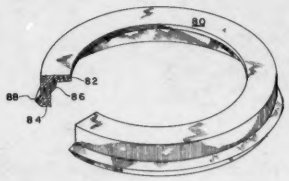
1. A fluid-tight sealing assembly for a vessel having a removable cover, comprising:

inner and outer rim members around the open end of said vessel, forming a slot therebetween;

a resilient sealing gasket having first and second shanks joined at approximately a right angle;

interior and exterior bead means formed on opposite sides of said first shank, said interior and exterior bead means being nonaligned with each other along the axial dimension of said first shank;

said first shank, said slot, and said interior and exterior bead means being dimensioned such that the thickness of said



first shank plus one of said bead means is less than the width of said slot, and the thickness of said first shank plus two of said bead means on opposite sides of said first shank is greater than the width of said slot, whereby the insertion of said first shank into said slot results in a bowing of said first shank along the axial dimension thereof; and

sealing means for forming a positive seal with said second shank and said inner rim member when said cover is attached to said vessel.

4,311,318

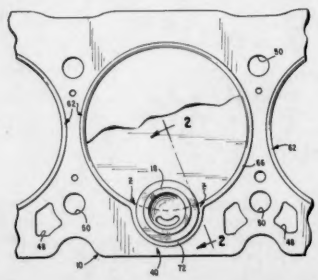
HEAD GASKET ASSEMBLY AND METHOD OF MAKING SAME

Daniel E. Czernik, Hinsdale, and John C. Moerk, Jr., Buffalo Grove, both of Ill., assignors to Felt Products Mfg. Co., Skokie, Ill.

Filed Dec. 1, 1980, Ser. No. 211,764

Int. Cl.³ F16J *15/12*

U.S. Cl. 277—235 B **13 Claims**



1. In a head gasket assembly for positioning between the head and block of an internal combustion engine and wherein said block defines a combustion cylinder and said head defines a bore in which a precombustion chamber is disposed, said precombustion chamber being positioned partially to overlie said combustion cylinder and to discharge into said combustion cylinder,

said gasket comprising a multi-layered main gasket body defining a combustion opening adapted to be disposed in-line with said cylinder and defining a plurality of other apertures spaced away from said combustion opening,

a fire ring secured to said body adjacent the periphery of said combustion opening and comprising a metallic annulus having legs lying generally parallel to said main gasket body, a wire ring disposed between said legs and within the periphery of said combustion opening and a precom-

bustion tab extending from one of said legs outwardly of said combustion opening and being adapted to underlie and support a precombustion chamber so that the precombustion chamber partially overlies said combustion opening, said precombustion chamber being adapted to overlie and to intersect said wire ring at two spaced zones of intersection,

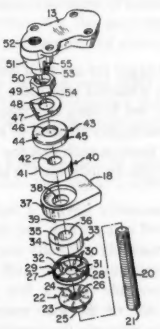
the improvement comprising spanner means underlying one of said legs at each of said two spaced zones of intersection, whereby when said gasket assembly is disposed between a said head and block and is placed under load, a more effective and consistent seal between the fire ring adjacent the precombustion tab and a head and a precombustion chamber will be obtained.

4,311,319

ROLLER SKATE

Charles W. Snyder, Dayton, and Shirley S. Weaver, Vandalia, both of Ohio, assignors to Snyder Skate Co., Inc., Dayton, Ohio

Filed Aug. 18, 1980, Ser. No. 179,247
Int. Cl.[3] A63C *17/02*
U.S. Cl. 280—11.28 **4 Claims**



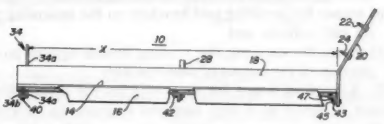
1. In a roller skate comprising a foot plate and a hanger bracket attached thereto, a truck frame having an axle-receiving part including an arm extending generally parallel to said bracket; a wheel support assembly secured to said hanger bracket and including a bolt extending approximately at right angles through said arm and into said bracket, and at least one polymeric compressible resilient member mounted on said bolt; the improvement comprising separate adjusting means mounted on said bolt for controlling the compression of said resilient member, said compressible resilient member comprising an upper cushion interposed between said arm and said bracket and a lower cushion below said arm, said wheel support assembly comprising an upper cushion cup partially enclosed and retaining said upper cushion against the upper surface of said arm and a lower cushion cup partially enclosing and retaining said lower cushion against the lower surface of said arm; said adjusting means comprising said lower cushion cup and a rotatable locking cap threadably disposed on said bolt adjacent to and interlocking with said lower cushion cup to selectively compress said cushions and to lock them into selected position in which said locking cap and said lower cushion cup have interengaging faces comprising radially extending serrations, a first set of serrations of one of said locking members being indented oppositely to a second set of serrations of the other locking member to effect interengagement between both sets of serrations, and means for preventing rotation of said lower cushion during rotation of said locking cap, said means comprising a first member mounted on said arm and a second member mounted on said lower cushion cup, both of said members interengaging said lower cushion to prevent said rotation, said first and second members of said rotation preventing means comprising a first elongated cylindrical pin mounted on the lower surface of said arm and a second elongated cylindrical pin mounted on the upper surface of said lower cushion cup, said pins extending in a direction parallel to the longitudinal axis of said bolt, said rotation preventing means further comprising at least one cylindrical longitudinally extending opening in said lower cushion also parallel to the longitudinal axis of said bolt, said pins fitting into said opening and extending through the upper and lower surfaces of said lower cushion and substantially therethrough.

4,311,320

RUNNING BOARD ASSEMBLY HAVING A UNIVERSAL MOUNTING BRACKET

John E. Waters, Jr., P.O. Box 8867, Waco, Tex. 76710

Filed Apr. 2, 1979, Ser. No. 26,283
Int. Cl.[3] B60R *3/00*
U.S. Cl. 280—163 **19 Claims**



1. A running board assembly for attaching a step platform on each side of a vehicle below the door thereof, comprising in combination,

(a) a running board for mounting on each side of said vehicle comprising an elongate metal plate having an upturned lip along one edge and a downturned lip along the opposite edge, said upturned lip adjacent said vehicle, said plate including a plurality of longitudinal ridges and at least one longitudinal groove having engaged therein an elongate elastomeric member which projects above the surface of said metal plate,

(b) a pair of universal mounting brackets for mounting said running boards one on each side of the vehicle, where the vehicle has either of two spacing distances between mounting points thereon and the spacing distances differ in length by a fixed distance, the universal brackets comprising:

(i) a first bracket which includes a first supporting beam having at least one mounting hole therein, the width of said first beam essentially equal to said fixed distance, and a first elongate plate joined transversely to said first beam on first side thereof wherein the plane of said first plate is essentially parallel to the axis of the mounting hole in said first beam,

(ii) a second bracket which includes a second supporting beam similar to said first beam and having at least one mounting hole therein, the width of said second beam essentially equal to said fixed distance, and a second elongate plate joined transversely to said second beam on a second side thereof, wherein the plane of said second plate is essentially parallel to the axis of the mounting hole in said second beam, said second plate mounted on the opposite side of said second beam from the position of said first plate on said first beam,

(iii) said first and said second brackets changeable between the sides of said vehicle to adapt to either of said two spacing distances between mounting points,

(c) means securing said brackets to the mounting points on said vehicle, and

(d) means securing said running boards to said brackets.

10. A pair of universal brackets upon which are mounted running boards, one on each side of a vehicle, wherein the vehicle has either of two spacing distances between the mounting points thereof and the spacing distances differ in length by a fixed distance, the brackets comprising in combination:

(a) a first bracket which includes a first supporting beam

having at least one mounting hole therein, said first beam having a width which is essentially equal to said fixed distance, and a first elongate plate joined transversely to said first beam on a first side thereof wherein the plane of said first plate is essentially parallel to the axis of the mounting hole in said first beam,

(b) a second bracket which includes a second supporting beam similar to said first beam and having at least one mounting hole therein, said second beam having a width which is essentially equal to said fixed distance, and a second elongate plate joined transversely to said second beam on a second side thereof, wherein the plane of said second plate is essentially parallel to the axis of the mounting hole in said second beam, said second plate mounted on the opposite side of said second beam from the position of said first plate on said first beam,

(c) said first and said second brackets changeable between the sides of said vehicle to adapt to either of said two spacing distances between mounting points,

(d) means for securing said brackets to the mounting points on said vehicle, and

(e) means for securing the running boards against an upper portion of the beams of said brackets.

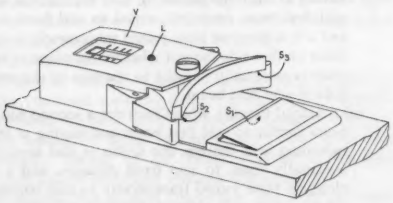
15. A running board for mounting on the lower side of a vehicle to serve as a step platform comprising an elongate metal plate having an upturned lip along one edge and a downturned lip along the opposite edge, said upturned lip adjacent said vehicle, said plate including a plurality of longitudinal ridges and at least one longitudinal groove, a plurality of mounting holes passing through said metal plate within said groove and an elongate elastomeric member for each groove to cover said mounting holes, each elastomeric member having a portion engaged in the groove and being dimensioned so that said elastomeric member extends above the surface of said metal plate between longitudinal ridges.

4,311,321

SKI BINDING

Josef Svoboda, Schwechat, Austria, assignor to TMC Corporation, Baar, Switzerland

Filed Jul. 10, 1979, Ser. No. 56,201
Claims priority, application Austria, Jul. 11, 1978, 4987/78
Int. Cl.³ A63C 9/00
U.S. Cl. 280—611 **7 Claims**



7. An electrically operated device for use on a ski binding arrangement to indicate an incorrect insertion of a ski boot into said ski binding arrangement, comprising:

an electrical supply source;

an electrical warning, indicating mechanism series connected to said electrical supply source; and

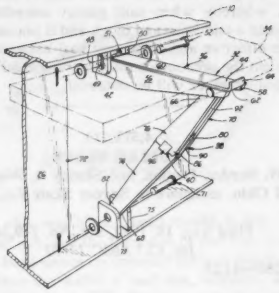
electrical switch means connected in electrical circuit with said electrical warning, indicating mechanism and said supply means and being responsive to an incorrect positioning of said ski boot when fixedly held in said ski binding arrangement to electrically complete the electrical connection of said supply means to said warning, indicating mechanism to effect a warning to the user of said ski binding arrangement that said ski boot is incorrectly fixedly, inserted into said ski binding arrangement.

4,311,322

SELF-LOCKING FOLDING OUTRIGGER ASSEMBLY

James M. Verros, Beresford, S. Dak., assignor to CMI Corporation, Oklahoma City, Okla.

Filed Mar. 31, 1980, Ser. No. 135,437
Int. Cl.³ B62D 21/00
U.S. Cl. 280—656 **18 Claims**



1. A folding outrigger for use on a load transporting vehicle having a first side, a second side and a load supporting structure therebetween, the folding outrigger in combination with adjacent folding outriggers adapted to receive and support an extension member thereon such that the load supporting structure of the vehicle can be increased in size, the folding outrigger comprising:

a first linkage assembly having a first end portion and an opposed second end portion, the first end portion of the first linkage assembly pivotally connected to one side of the load transporting vehicle such that the first linkage assembly is movable from a first position substantially adjacent the side of the load transporting vehicle to a second position wherein the longitudinal axis of the first linkage assembly is substantially parallel to a lateral axis of the load supporting structure;

a second foldable linkage assembly having a first end portion and an opposed second end portion, the first end portion of the second foldable linkage assembly pivotally connected to the opposed second end portion of the first linkage assembly, the opposed second end portion of the second foldable linkage assembly pivotally connected to the one side of the transporting vehicle such that the opposed second end portion of the second foldable linkage assembly is disposed a distance from the first end portion of the first linkage assembly and substantially vertically aligned therewith, the second foldable linkage assembly being movable between a folded first position wherein the second foldable linkage assembly is in a folded position substantially adjacent the side of the load transporting vehicle when the first linkage assembly is in the first position and an extended second position wherein the second foldable linkage assembly positions the first linkage assembly in its second position; and

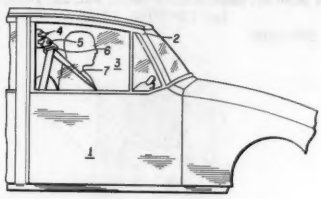
combination pivot-locking means operably disposed on the second foldable linkage assembly for enabling pivotal movement of the second foldable linkage assembly between the folded first position and the extended second position, the combination pivot-locking means being adapted to lock the second foldable linkage assembly in its extended second position, the combination pivot-locking means further being adapted to lock the first linkage assembly and the second foldable linkage assembly in their respective first positions substantially adjacent the one side of the load transporting vehicle.

4,311,323

ADJUSTABLE FIXING DEVICE OF A SAFETY BELT ANCHORING POINT

Jacques Provensal, Maurepas, France, assignor to Regie Nationale des Usines Renault, Boulogne Billancourt, France

Filed Feb. 11, 1980, Ser. No. 120,318
Claims priority, application France, Feb. 9, 1979, 79/03328
Int. Cl.[3] B60R *21/10*
U.S. Cl. 280—801 12 Claims



1. An adjustable fixing device for attaching a safety belt anchoring point at a support element of a vehicle body permitting at least two positions for the anchoring point and for allowing an emergency release of the safety belt, said adjustable fixing device comprising:

a guide formed by a pair of spaced apart members;

a mobile anchoring bracket releasably fixed to said guide;

removable fixing means disposed between said spaced apart members; and

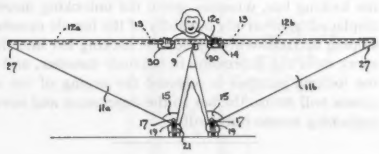
a U-shaped control lever connected with the bracket and said fixing means for releasing and shifting the bracket in the guide.

4,311,324

SKATING SAILS

James E. Fries, 1530 Fulton Ave., Apt. 84, Sacramento, Calif. 95725

Filed Dec. 31, 1979, Ser. No. 108,570
Int. Cl.[3] A63C *11/00*
U.S. Cl. 280—810 19 Claims



1. A sail device for use in propelling a skater on skate means comprising

an elongated balancing pole having a length substantially greater than the outstretched extent of the skater's arms,

a flexible sail suspended from said pole in a symmetrical manner, and

means for removably coupling predetermined bottom portions of said sail to the legs of the skater,

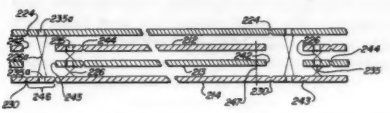
whereby central portions of said pole are adapted to be grasped by the skater and the sail held in a position so as to catch the wind.

4,311,325

METHOD OF MAKING A CONTINUOUS WEB FORM AND PRODUCT, PARTICULARLY ONE SUITABLE FOR AIRLINE TICKETING

Donald J. Steidinger, Barrington, Ill., assignor to Wallace Business Forms, Inc., Hillside, Ill.

Continuation-in-part of Ser. No. 914,381, Jun. 12, 1978, Pat. No. 4,208,066, which is a continuation-in-part of Ser. No. 483,952, Jun. 28, 1974, Pat. No. 4,109,936, which is a continuation-in-part of Ser. No. 453,556, Mar. 21, 1974, abandoned, which is a continuation of Ser. No. 374,274, Jun. 27, 1973, abandoned. This application Nov. 30, 1979, Ser. No. 98,992
Int. Cl.[3] B41L *1/20*
U.S. Cl. 282—11.5 A 7 Claims



1. A continuous multiple ply form particularly suitable for airline ticketing comprising a continuous first ply ultimately constituting the top plies of ticket assemblies developed therefrom, said first ply being equipped with means for controlling the movement of a connected series of tickets through a printer, said first ply also being equipped with equally longitudinally spaced transverse lines of weakness for detaching ticket assemblies from said continuous form,

a continuous second ply ultimately constituting the bottom plies of ticket assemblies developed from said form, said second ply also being equipped with first transverse lines of weakness aligned with and underlying the lines of weakness aligned with and underlying the lines of weakness of said top ply, said second ply being equipped with second transverse lines of weakness positioned adjacent said first lines but spaced therefrom to provide a manually graspable portion, adhesive connecting said first and second continuous plies in said manually graspable portion, and

a plurality of intermediate plies positioned between said first and second continuous plies, said intermediate plies having a first end generally aligned with said second ply second line of weakness and extending toward said second ply first line of weakness to position the second end thereof adjacent said first line of weakness, said intermediate plies being eqch equipped with a transverse line of weakness positioned adjacent said first end but spaced therefrom to provide a ticket stub, said intermediate plies and bottom ply being adhesively connected in said stub whereby grasping with one hand said intermediate and bottom plies adjacent said second end and said manually graspable portion with the other hand permits separation of a packet from said assembly.

4,311,326

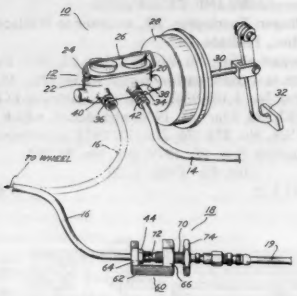
ADAPTER FOR BLEEDING BRAKE LINES

Gerald D. Ringle, 3025 W. U.S. 12, Michigan City, Ind. 46360

Filed Jan. 4, 1980, Ser. No. 109,653
Int. Cl.[3] F16L *3/00*
U.S. Cl. 285—62 4 Claims

1. An adapter for connecting a flared end brake line at the master cylinder fitting to a pressure bleeder, comprising a rigid, generally U-shaped adapter body having a base and end walls extending outwardly from said base, a slot in one of said end walls extending from the edge of said one end wall toward said base, said slot being of a width greater than the diameter of the brake line but less than the diameter of the fitting on the brake line, a threaded element having a tapered end for seating in the flared end of a brake line and an internal passage therethrough, a means including a threaded hole disposed in the

other of said end walls receiving said threaded element for moving the tapered end of said element into seating relation



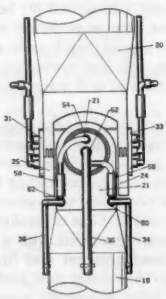
with the brake line and for retaining said element in seating relation with the brake line, and means for connecting said element to a pressure bleeder.

4,311,327

UNIVERSAL JOINT FOR MULTIPLE FLOWLINE SYSTEM

John E. Ortloff; Clarence F. Stelzer, Jr., and Donald R. Hayes, all of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Dec. 20, 1979, Ser. No. 105,679
Int. Cl.³ F16L *39/00*
U.S. Cl. 285—136 **12 Claims**



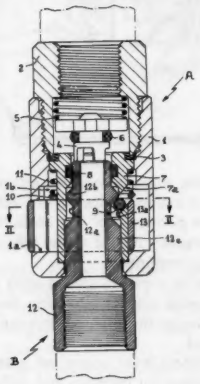
1. A universal joint comprising:
a first longitudinally extending member;
a second longitudinally extending member;
means for connecting said first member to said second member to permit said first member to pivot about an axis normal to the longitudinal axis of the said first member and to permit said second member to pivot about an axis normal to the pivotal axis of said first member;
at least one elbow conduit extending through said connecting means, said elbow conduit having at least one end portion being offset from and extending substantially parallel to one of said pivotal axis;
a first conduit supported by said first member and connected to said offset end portion of said elbow conduit;
a second conduit supported by said second member and connected to the other end of said elbow conduit;
a pivot means disposed between said first conduit and said offset end portion of said elbow conduit for enabling pivotal movement between said elbow conduit and said first conduit; and
a compensating means disposed in said first conduit permitting extensible movement of said first conduit to enable rotational movement of said pivot means around the pivot axis of said first longitudinally extending member.

4,311,328

RAPID FITTING DEVICES FOR JOINING PIPES

Gaston Truchet, Faverges, France, assignor to S.A. des Etablissements STAUBLI (France), Faverges, France

Filed Jul. 22, 1980, Ser. No. 171,058
Claims priority, application France, Jul. 23, 1979, 79 19383
Int. Cl.³ F16L *37/08*
U.S. Cl. 285—308 **1 Claim**



1. In a fitting for joining two pipes, the fitting having a female member attached to one pipe and a male member attached to the other pipe and axially fitting into the female member, the male member having an annular depression thereabout and the female member having at least one slot therein opposite said depression and opening obliquely thereinto, and the female member having a cylindrical locking bar occupying each slot and having a central portion between its ends which can enter the depression of the male member and having axially acting spring means yieldably urging the locking bar to engage in the depression of the male member, improved means for displacing the bar from the depression comprising:
(a) in the female member a notch extending transversely thereinto adjacent to the oblique slot; and
(b) an unlocking member supported in the female member in the notch and surrounding the male member, the unlocking member having inner edges including surfaces sloping at right angles to the oblique slot and abutting the ends of the locking bar, whereby when the unlocking member is displaced transversely inwardly of the female member the sloping surfaces will displace the locking bar into the slot away from the depression in the male member, and when the locking member is released the urging of the spring means will return the bar to the depression and move the unlocking means outwardly.

4,311,329

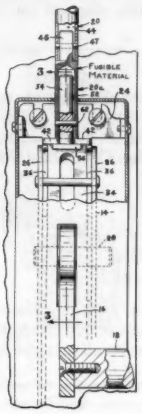
PANIC-TYPE DEVICE HAVING FUSIBLE SECTION IN PUSH ROD TO AVOID UNINTENTIONAL OPENING OF DOOR IN EVENT OF FIRE

Stephen L. Kral, Garfield Heights, Ohio, assignor to Scovill Inc., Waterbury, Conn.

Filed Nov. 2, 1979, Ser. No. 90,557
Int. Cl.³ E05C *15/02*
U.S. Cl. 292—92 **2 Claims**

1. A latching device operable by a panic member and including a waist-level housing pivotally mounting a lever terminating outwardly in said panic member; a yoke element engaged

by the lever and adapted to raise when the panic member is pushed toward the door, the yoke element comprising a pair of spaced horizontal fingers; a latch at the upper end of the door and a push rod extending between the housing and the latch adapted on the actuation of the lever to move upward to actuate the upper latch, the lower portion of the push rod terminating in a fusible section, said section being formed with an upward axial opening in its lower end; and a headed element



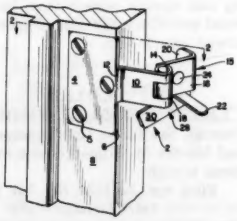
having a reduced shank extending up into the opening, the head being spaced from said end, the head and end being disposed respectively closely below and above the fingers and the shank being disposed between the fingers thereby linking the up and downward movement of the yoke and the push rod whereby under extreme heat the fusible section will melt to prevent the thermal expansion of the rod from inadvertently unlatching the upper latch.

4,311,330

DOOR LATCH

Albert C. H. Lum, Honolulu, Hi., assignor to D.S.L. Inc., Honolulu, Hi.

Filed Dec. 21, 1979, Ser. No. 106,012
Int. Cl.³ E05C *1/04*
U.S. Cl. 292—210 **4 Claims**



1. A door latch, comprising:

a mounting plate adapted to be secured against the frame of an inwardly-opening door and an extension adapted to extend inwardly away from the door frame,

a latch comprising an arm having one end pivoted to the mounting plate extension and a flange on the opposite end thereof, said latch being pivotal between a normal door-blocking position in which said arm lies adjacent said plate extension and said flange is disposed in the swing path of the door, and a door-unblocking position in which said flange lies clear of the swing path of the door, and

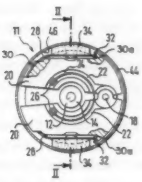
a latch retainer comprising a flat strip having one end pivoted to said arm and means on another end for engaging between the door edge and the door frame for preventing pivotal movement of the latch from its door blocking position, said latch retainer being substantially L-shape, said one end thereof being one leg of the L and the mounting thereof on said latch arm being a pivot, the other end of the latch retainer being the other leg of the L, the latch arm and flange being of flat plate material and the flange extending at substantially 90° with respect to the latch arm, said latch also including an integral tab extending at substantially 90° with respect to the other side of said latch arm, whereby when said other end of said latch retainer is disengaged from between said door edge and door jamb, the door may be cracked open so as to swing said latch arm away from its normal door-blocking position until said tab engages the end edge of said door.

4,311,331

CLUTCH ASSEMBLY FOR DOOR LOCK SYSTEM

Manfred Lutz, Schweinfurt, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Jun. 28, 1979, Ser. No. 53,507
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1978, 2829925
Int. Cl.³ E05C *13/04*; F16D *43/18*
U.S. Cl. 292—336.3 **17 Claims**



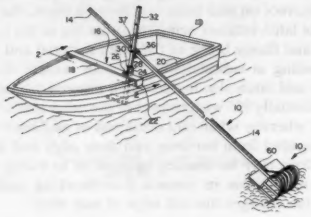
1. In a door lock system especially for motor vehicles including a flywheel mass driven by electric motor means, an actuating member driven by said flywheel mass and connecting means including centrifugal clutch means operatively interposed between said flywheel mass and said actuating member, the improvement wherein said centrifugal clutch means comprise: centrifugal weight means mounted on carrier means for movement between a clutch-engaged position and a clutch-disengaged position; restoring spring means for restoring said centrifugal weight means to said clutch-disengaged position; first frictional engaging means mounted on said centrifugal weight means; driven output means arranged in driving connection with said actuating member and including second frictional engaging means adapted to be frictionally engaged with said first frictional engaging means; resilient means supporting said first frictional engaging means on said centrifugal weight means; and stop means for limiting movement of said centrifugal weight means in a direction toward said clutch-engaged position; said first frictional engaging means comprising friction pads defining frictional engaging surfaces thereon, said frictional pads being supported by said resilient means at said centrifugal weight means; said resilient means comprising spring means held under an initial spring tension at said centrifugal weight means; said spring means comprising a leaf spring fastened at one end to said centrifugal weight means; said leaf spring having its other end free and movable and held against an abutment surface when said centrifugal weight means is in its clutch-disengaged position, said leaf spring being arranged to be lifted off said abutment surface when said first frictional engaging means is in engagement with said second frictional engaging means.

4,311,332

SHELLFISH RAKE CONSTRUCTION

Norman A. Walker, 16 Buxton Ave., Somerset, Mass. 02727

Filed Nov. 19, 1980, Ser. No. 208,225
Int. Cl.³ A01D *1/14*
U.S. Cl. 294—50.9 **10 Claims**



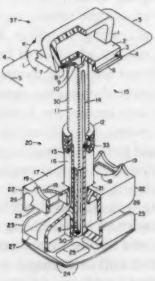
1. An improved rake for shellfish and the like comprising a basket in part formed from a plurality of laterally spaced generally U-shaped tines defining a rear heel and a normally open face to said basket, forward portions of said tines adapted to contact the bed of the ocean or other body of water in operating position, a plate extending laterally across the rear of said basket so as to interconnect rear portions of said tines, guide means disposed at the rear of said basket for slidably receiving an elongated handle adapted to extend through the surface of said body of water downwardly to said basket while its upper end remains above said surface, said handle terminating at its lower end in a stop adapted to engage said basket guide means in a first position thereof such that upward movement on said handle will drag said basket along said bed, and downward movement on said handle will push said basket along said bed, said basket freely slidably movable along said handle for substantially the entire extent thereof when said stop is positioned relative to said guide means in an alternate second position, and a line attached to said basket and adapted to extend upwardly along said handle such that said basket may be slidably drawn to the water surface along said handle while the handle remains positioned in the water as above described.

4,311,333

EQUIPMENT CARRYING AND, OR, SECURING DEVICE

John M. Crump, 1018 Parkridge Cir. W., Jacksonville, Fla. 32211

Filed Mar. 10, 1980, Ser. No. 128,673
Int. Cl.³ A45F *5/10*
U.S. Cl. 294—147 **11 Claims**



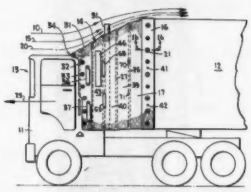
1. A device for carrying and/or securing any desired combination of equipment such as skis, poles and boots comprising:
first retention means for releasable engagement with oppositely disposed boot toes;
second retention means for releasable engagement with oppositely disposed boot heels;
means provided with one of said retention means to retain said skis and poles therewith;
base member cooperating with said retention means for supporting and guiding the selective manipulation of said retention means into cooperative engagement with said equipment;
and securing means releasably engageable to said base member and adjustably disposed on one of said retention means.

4,311,334

UNIVERSAL TOWED VEHICLE WIND UMBRELLA

Maurice A. Jenkins, 151 Dix Dr., North Versailles, Pa. 15137

Filed Oct. 25, 1979, Ser. No. 88,029
Int. Cl.³ B62D *35/00*
U.S. Cl. 296—1 S **9 Claims**



1. A universal, towed vehicle, wind umbrella for use on a towed vehicle having a projected frontal area of a given size in combination with a towing vehicle having a projected frontal area of a smaller given size than that of said towed vehicle to thereby provide an aerodynamically improved combination of a towing and towed vehicle set, said wind umbrella comprising
a first section having only a pair of vertical sides and a top side which are integrally connected to said pair of vertical sides releasably secured to and over the sides and top of said towed vehicle, and
a second flexible moulded section which mounts over a portion of the roof of said towing vehicle and is releasably secured thereto, and
an adjustably flexible middle section integrally secured respectively to said first section and to said second section to thereby form a three sided universally mountable and aerodynamically efficient vehicle set, when said vehicle set is moving,
said first, middle and second sections, upon release from said towing vehicle for storage on said towed vehicle thereby freeing said towing vehicle from being encumbered by said wind umbrella while operating away from the towing and towed vehicle set.

4,311,335

CRASH RESISTANT MOTORCYCLE

Tadeus Winiecki, San Diego, Calif., assignor to Henry F. Winiecki and Martha M. Winiecki, both of Vancouver, Wash., part interest to each

Filed Apr. 24, 1980, Ser. No. 143,527
Int. Cl.³ B62J *27/00*
U.S. Cl. 296—78.1 **17 Claims**

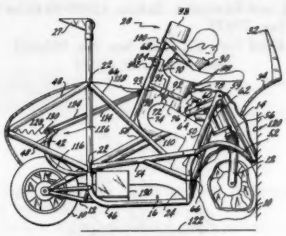
1. In a motorcycle having two wheels located in tandem, a frame interconnecting said wheels, a steering assembly for steering at least one wheel and a seat assembly for supporting at least one rider, the improvement comprising:
a cage of high strength tubing attached to said frame and substantially surrounding the front, back and sides of a rider in said seat;
a panel body substantially covering said cage;
at least one door in said body adjacent to said seat hingedly mounted to permit opening for rider ingress and egress;

said seat assembly including a padded seat and a padded restraint adapted to substantially encircle the torso of a rider from hips to neck;

a padded headrest extending upwardly of said seat behind a rider's head to limit rearward head movement;

a padded collar on said restraint extending around the sides and front of a rider's head at about chin level to limit side and front head movement;

quick release means for holding said seat and body restraint together and for releasing them for rider ingress and egress;



shock absorber means connected to said seat to absorb energy resulting from inertial forces on said seat and rider therein during a frontal collision between said motorcycle and an object;

seat retrieval means to automatically return said seat to approximately the original position after said shock absorber has adsorbed said energy; and

anti-somersault means extending forwardly of said cage to a point above the horizontal center of mass of said motorcycle and rider therein to prevent somersaulting during frontal impact.

4,311,336

WINDOW FRAME FOR PASSENGER VEHICLES

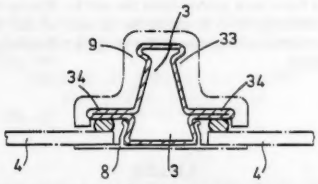
Ludwig Geyer, Puchheim, and Franz Jarauch, Roehrmoos, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nuernberg Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 21, 1979, Ser. No. 77,630

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1978, 2841177

Int. Cl.³ B62D *25/02*

U.S. Cl. 296—201 **10 Claims**



1. A passenger vehicle comprising a tubular metal frame comprising two spaced vertical side members, an upper longitudinal member and a lower longitudinal member, said upper and lower longitudinal members intersecting said vertical side members to define a window opening, said side members and said upper and lower longitudinal members each comprising a hollow cross-section and an integrally-formed bead portion in the form of a protrusion projecting from one wall of the member into said window opening, said bead members all lying in a common plane, the side of said bead portion forming an angle of less than 90° with the adjoining wall portion of said member; said vehicle further comprising a pane of essentially transparent material positioned in said window opening and abutting against said bead portion and an adhesive interposed between said pane and said bead portion for bonding said pane to said bead portion and a resilient cover member for covering a gap between the pane and one of said vertical or longitudinal members, resiliently engaged over the angular adjoining wall of one of said members.

4,311,337

COMBINATION FURNITURE

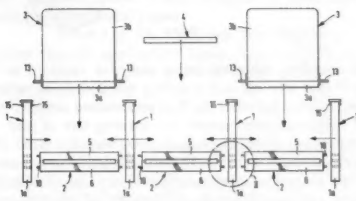
Oswald Brunn, Bunzlauer Platz 1, D-8000 Munich 50, Fed. Rep. of Germany

Filed Jun. 4, 1979, Ser. No. 44,866

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1978, 2825408

Int. Cl.³ A47C *1/124*

U.S. Cl. 297—249 **9 Claims**



1. Combination furniture comprising:

vertical frame-like side sections (**1**) of similar construction, each having a front leg and a back leg, an upper horizontal strut (**14**) defining an arm rest and a lower horizontal strut (**11**), each of which struts are connected to the front leg and back leg;

cross ties (**2**) each inserted between a pair of front legs and a pair of back legs;

connections between said cross ties (**2**) and said legs comprising plugs (**10**) engaging bore holes in said legs and a securing bolt means (**8**) clamping the cross ties to the legs;

a folding seat including a seat section (**3***a*) and a back section (**3***b*), that can be inserted between the two side sections above said cross ties;

a hinge (**21**) connecting the seat section and the back section adjacent each side thereof, said hinges (**21**) having laterally protruding pivot pins (**23**), wherein said side sections have recesses (**12**) in the top of each lower horizontal strut (**11**) for receiving said laterally protruding pivot pins, and means (**16, 35, 37**) adjustably securing the seat section and the back section to the side sections at locations on the seat section and back section remote from said hinges (**21**); and

a further furniture module secured to at least one other side of said side sections using further cross ties that are secured to said side sections in the same manner as said cross ties inserted between said legs.

4,311,338

ARMREST ASSEMBLY FOR A SEAT

David Moorhouse, Blackthorn, England, assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 15, 1979, Ser. No. 84,923

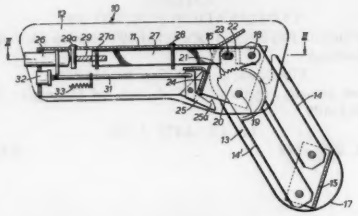
Claims priority, application United Kingdom, Nov. 1, 1978, 42780/78

Int. Cl.³ A47C *7/54*

U.S. Cl. 297—411 **4 Claims**

1. A height-adjustable armrest assembly for a seat comprising an armrest, a support mechanism including a first support member for connection to the seat and a second support member connected to the rear end portion of the armrest, the support mechanism being a parallelogram-action mechanism

which supports the armrest from its rear end portion as a cantilever and which permits relative movement between said support members while maintaining them at a said constant inclination to one another, and having a coupling manually operable to lock the support mechanism, and wherein the coupling comprises a first toothed coupling member movable with a first part of the parallelogram support mechanism and a second toothed coupling member forming an integral portion of a second part of the support mechanism, said first part and



said first coupling member being movable relative to said second part and said second coupling member in response to relative movement between the first and second support members, and height-adjuster means for moving one of said coupling members out of locking engagement with the other of the coupling members so as to freely permit relative movement of said first and second support members to any one of a plurality of positions corresponding to a plurality of predetermined vertically-spaced, generally horizontal positions of the armrest.

4,311,339

INFANT CARRIER

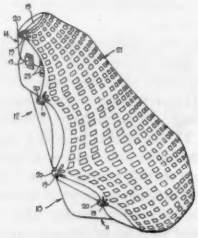
Robert B. Heath, Lonsdale, Australia, assignor to Rainsfords Metal Products Pty. Ltd., South Australia, Australia

Filed Nov. 7, 1979, Ser. No. 92,072

Claims priority, application Australia, Nov. 21, 1978, PD6850

Int. Cl.[3] A47C *31/00*; B60R *21/00*

U.S. Cl. 297—487 **6 Claims**



1. An infant carrier comprising walls defining an integral seat and seat back portion, being respectively a short limb and a long limb,

further walls defining a seat frame extension, and securing means between the frame extension and the integral seat and seat back portion, which said securing means comprise first securing means which releasably secure the frame extension to the seat portion to form an open top container for use in a supine mode, and second securing means which releasably secure the frame extension to said short limb to thereby elevate the seat and seat back portion for use in a seating mode, and

a flexible cover sheet of resilient perforate material, sheet retention means on the container wall structure, and complementary retaining means on the cover sheet releasably engageable with the sheet retention means to thereby retain the sheet to the container walls over the open top of the container when the carrier is used in the supine mode.

4,311,340

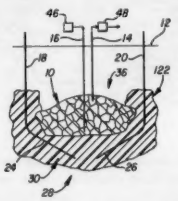
URANIUM LEECHING PROCESS AND INSITU MINING

William C. Lyons, 1209 Calle Luna, Santa Fe, N. Mex. 87501; Cheryl K. Rofer-DePoorter, 125 San Juan, Los Alamos, N. Mex. 87544; Donald B. Buddecke, Rte. 1, 635A, Rockport, Tex. 78382, and Edward A. Zublin, 12800-99 Briar Forest Dr., Houston, Tex. 77077

Filed Nov. 27, 1978, Ser. No. 963,825

Int. Cl.[3] E21B *43/28*

U.S. Cl. 299—4 **15 Claims**



1. Method for recovering metal values by insitu leaching of an ore body located below the surface of the earth, comprising the steps of:

(1) forming an upwardly opening impervious barrier within which the ore body is contained by drilling a plurality of boreholes about the periphery of the ore body to be leached, wherein the boreholes extend from the surface of the earth, downhole beside the ore body, and then turn laterally and continue across the bottom of the ore body;

(2) pumping a barrier-forming substance downhole through said boreholes in sufficient quantity to form a continuous wall which extends circumferentially about and under the ore body; wherein said barrier-forming substance has the property of being a liquid when pumped downhole and where thereafter said barrier-forming substance forms an impermeable barrier;

(3) flowing leaching fluid downhole into intimate contact with said ore body where said leaching fluid is contained in intimate contact with said ore body by said barrier;

(4) recovering the pregnant leaching fluid after the mineral values have been gained from the ore by driving the pregnant leaching fluid towards the surface of the ore body with a water drive where the pregnant leaching fluid is produced.

4,311,341

RESTORATION OF URANIUM SOLUTION MINING DEPOSITS

Frederick W. DeVries, Chadds Ford, Pa., and Bernard C. Lawes, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 892,754, Apr. 3, 1978, abandoned. This application Oct. 9, 1979, Ser. No. 82,553

Int. Cl.[3] E21B *43/28*

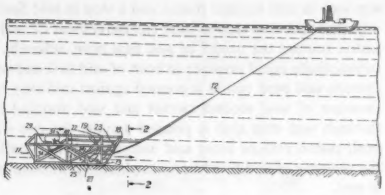
U.S. Cl. 299—5 **3 Claims**

1. In the solution mining of a uranium ore deposit using an aqueous leaching solution containing an ammonium carbonate, the improvement comprising: injecting into the ore deposit after mining has ceased an aqueous solution of a potassium salt.

4,311,342
DREDGE HEAD WITH MECHANICAL AND PUMPING ACTION

John P. Latimer, Newport News, Va., assignor to Deepsea Ventures, Inc., Gloucester Point, Va.

Filed Oct. 30, 1978, Ser. No. 955,648
Int. Cl.[3] E02F 5/00
U.S. Cl. 299—8 20 Claims



1. A dredge device for collecting ore fragments from the ocean floor, the device comprising:

support means to support and permit the movement along the ocean floor of said dredge device;

a powered rotor for collecting fragments, the rotor being positioned such that its longitudinal axis is transverse to the intended direction of movement of the dredge device;

spoke means extending outwardly from the rotor and positioned with respect to the support means that when the dredge device is moving along the ocean floor the outermost portion of the spoke means, at the lowermost point of rotation, makes contact with the ocean floor surface, so as to dislodge ore fragments;

a curved shroud fairing divergently positioned around the rotor, defining a divergent flow passage with the rotor, the

passage having an inlet and an outlet, the outlet being positioned such that water flowing towards the rotor as the dredge device is moved in its expected manner flows through the inlet towards the rotor;

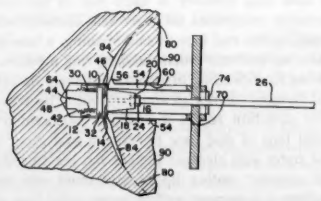
conveying means having a first end and a second end, the first end being positioned adjacent the rotor to pick up ore fragments dislodged by the spoke means on the rotor; and

transport connection means, adapted to be connected to transport means for carrying ore fragments from the dredge device on the ocean floor to the ocean surface, the connection means being positioned adjacent the second end of the conveyor means, whereby ore fragments on the conveyor means enter the connection means.

4,311,343
APPARATUS FOR BREAKING ROCK OR CONCRETE

William C. Cooley, Bethesda, Md., assignor to Terraspace, Inc., Rockville, Md.

Filed Apr. 25, 1980, Ser. No. 143,957
Int. Cl.[3] E21C 37/02, 37/06
U.S. Cl. 299—22 5 Claims



1. Apparatus for breaking hard compact material such as rock adjacent a hole drilled thereinto comprising

an expandable notcher member means carrying at one end a single turn, screw-threaded member of high strength metal to serve as a notch forming element and terminating at the other end in a rotatable cylindrical member having an opening therein,

power or manual means received in said opening for self-threading said notcher means into the rock developing a small axial resistance,

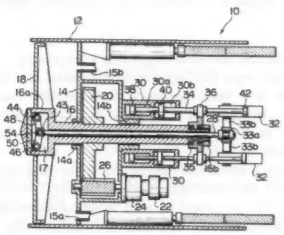
hydraulic jack means located within a drillhole for reacting against the hole bottom to drive a cone surface against the notcher means to expand the screw-threaded notcher means into the rock, and

means applying axially disposed outward force through the notcher means against the rock for causing a portion of rock to be broken free.

4,311,344
SHIELD-TYPE TUNNELING MACHINE WITH TOGGLE CONTROLLED BIT PLATES IN CUTTER DISC

Toshio Akesaka, Yono, Japan, assignor to Kabushiki Kaisha Iseki Kaihatsu Koki, Japan

Filed Apr. 14, 1980, Ser. No. 140,169
Claims priority, application Japan, Sep. 12, 1979, 54-116092
Int. Cl.[3] E21D 9/08
U.S. Cl. 299—33 4 Claims



1. A shield-type tunneling machine comprising

a shield body;

a partition wall fitted across said shield body;

a hollow rotary shaft rotatably supported by said partition wall;

a cutter disc attached to the front end of said rotary shaft at the front of said partition wall and including first and second cutter slits provided therein in diametrical alignment with each other;

a slide shaft disposed within said hollow rotary shaft rotably integrally therewith;

said cutter disc including a first slit-opening member comprising a pair of comb-type bit-plates disposed in said first cutter slit and a second slit-opening member comprising a pair of comb-type bit-plates disposed in said second cutter slit;

means for interconnecting said slide shaft to said respective slit-opening members and for pivotally moving said slit-opening members to thereby open or close said respective cutter slits when said slide shaft is slidingly moved in the axial direction thereof;

said means for pivotally moving said slit-opening members comprising first and second trunnions having arms pivoted to the opposite sides of the front end of said slide shaft, and extending at first ends thereof into said first slit and at the other ends into said second slit, and an interlocking mechanism interconnecting said first and second trunnions with each other and rotating said trunnions mutually in opposite directions when said slide shaft is caused to reciprocate, one end of said first trunnion being secured to one of the bit-plates of said first slit-opening member, and one end of said second trunnion being pivoted to the other bit-plate of said first slit-opening mem-

ber, the other end of said first trunnion being pivoted to one of the bit-plates of said second slit-opening member, and the other end of said second trunnion being secured to the other bit-plate of said second slit-opening member.

4,311,345

TWO-CIRCUIT PRESSURE REGULATOR

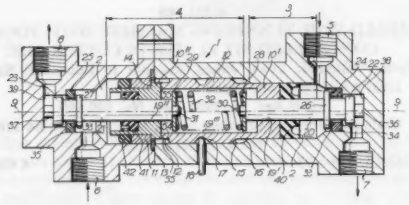
Bernd Schopper, Frankfurt am Main, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Mar. 17, 1980, Ser. No. 130,907

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1979, 2915865

Int. Cl.³ B60T *11/32*

U.S. Cl. 303—84 A **14 Claims**



1. A two-circuit pressure regulator comprising:

a housing having a first bore therein coaxial of a longitudinal axis, said first bore having a first smaller diameter area adjacent one end of said housing and a second larger diameter area adjacent the other end of said housing;

a first circuit including

a first inlet disposed in said housing opening into said bore adjacent said one end of said housing,

a first outlet disposed in said housing opening into said bore adjacent said one end of said housing space and from said first inlet, and

a first pressure regulating valve having a first piston shaft coaxial of said axis extending toward the center of said first bore and a first valve body disposed between said first inlet and said first outlet, said first valve being biased in an opening direction, which closes when a first predetermined switching pressure occurs and which influences the pressure in said first outlet according to a predetermined control action when a further pressure increase occurs in said first inlet;

a second circuit including

a second inlet disposed in said housing opening into said bore adjacent said other end of said housing,

a second outlet disposed in said housing opening into said bore adjacent said other end of said housing spaced from said second inlet, and

a second pressure regulating valve having a second piston shaft coaxial of said axis extending toward the center of said first bore and a second valve body disposed between said second inlet and said second outlet, said first valve being biased in an opening direction which closes when a second predetermined switching pressure occurs and which influences the pressure in said second outlet according to a predetermined control action when a further pressure increase occurs in said second inlet;

an annular leak indication piston disposed coaxially of said axis and slideably guided in said first bore having applied to one end thereof the pressure at said first inlet and outlet and having applied to the other end thereof the pressure at said second inlet and outlet said annular piston being axially shifted in one of said first and second circuits relative to the other of said circuits with a pressure drop in either of said first and second circuits to operate a leak indication switch lever, said annular piston having a first end piece with a first end surface of relative large area adjacent said first inlet and outlet slideably guided in said first area of said bore, a second end piece with a second end surface having a smaller area than said first end surface adjacent said second inlet and outlet, and a second bore therein coaxial of said axis to slideably guide therein said first and second piston shafts;

an annular push piston slideably guided on the outer surface of said second end piece and slideably guided in said second area of said first bore; and

a stop step in said annular piston and a stop in said first bore adjacent said stop step to limit the movement of said push piston toward the center of said first bore, whereby with substantially equal pressure in both of said first and second circuits said push piston is pressed against said stop by the pressure of said second circuit and said annular piston through said stop step is pressed against the end of said push piston remote from said second inlet and outlet by the pressure of said first circuit to place said annular piston at rest.

4,311,346

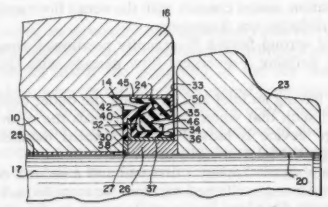
TRACK ASSEMBLY HINGE JOINT

Bill A. Danner, Rochester, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Jun. 29, 1979, Ser. No. 53,362

Int. Cl.³ F16J *15/32;* **B62D** *55/20*

U.S. Cl. 305—11 **4 Claims**

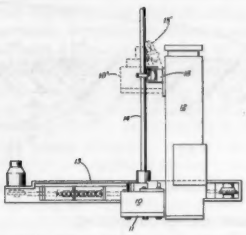


1. A hinge joint for connecting track elements of an endless track vehicle which comprises a bushing secured at its ends to the spaced ends of a pair of link plates and a pin received in the bushing and secured at its ends to the ends of a pair of adjoining link plates which are disposed outboard of the bushing carrying link plates, an axial movement limiting ring member secured on said pin adjacent each end of the bushing, a sleeve member secured on the pin and disposed between the bushing and the pin which sleeve member is formed of self-lubricating material, a washer formed of self-lubricating material secured on the pin at each end of the bushing which is disposed adjacent the end face of the bushing and the end face of said axial movement limiting ring member and a seal assembly mounted on said ring member at each end of the bushing, said seal assembly comprises an inner seal element which has a face engaging the end face of said bushing, a base portion which is seated on said movement limiting ring member, and an annular sealing lip extending in an outward axial direction and an outer seal element having an annular sealing lip which extends in an axial direction and is in resilient engagement with an outer radial face of said base portion of said inner sealing element, said outer seal element further having an outer base portion, said annular sealing lip of said inner seal element being in resilient engagement with an inner radial face of said outer base portion, and said base portion of said inner seal element is disposed between an outer radial face of said movement limiting ring member and the radially inner most portion of said outer seal element.

4,311,347
DRILL STEEL GUIDE

William R. Cobb, Murrysville, Pa., assignor to Schroeder Brothers Corporation, McKees Rocks, Pa.

Filed Oct. 10, 1979, Ser. No. 83,377
Int. Cl.³ F16C 31/00
U.S. Cl. 308—3.9 4 Claims



1. A drill steel guide for mine roof drilling and bolting machine in which the drill pod is raised and lowered along a generally vertical track, said drill steel guide mounted relative to the vertical track spaced from the downwardmost position of the drill pod, said drillsteel guide comprising

a main shaft mounted on a generally horizontal axis relative to said vertical track;

a clevis body pivotally mounted to said shaft, said clevis body swingable from a generally horizontal to a generally vertical position,

a stop fixed relative to said shaft to limit the downward swing of the clevis body,

two retaining arms pivotally mounted to said clevis body on separate axles fixed to the clevis body, said axles being perpendicular to the main shaft and generally parallel to the drill steel when the clevis body is resting on said stop, said retaining arms together defining a drill steel guide passage for receiving the drill steel,

means secured to the clevis body for biasing the retaining arms together,

means to releasably latch the clevis body in vertical position,

palm lock means having a shaft portion slidably journaled in said clevis body in a bore having an axis parallel to the retaining arms axles and extensions for in one position restraining both retaining arms and in another position not restraining either retaining arm.

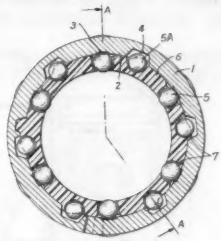
4,311,348
LINEAR MOTION BALL BEARINGS

Armin Olschewski, Schweinfurt; Manfred Brandenstein, Eussenheim; Lothar Walter, Schweinfurt; Horst M. Ernst, Eltingshausen, and Friedrich Schido, Heusweiler, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jul. 5, 1979, Ser. No. 55,056
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1978, 2830400
Int. Cl.³ F16C 29/06; B21D 53/10
U.S. Cl. 308—6 C 11 Claims

1. In a linear motion ball bearing including an outer race sleeve formed from a flat plate having opposite ends, the plate bent to form a cylindrical split-sleeve tube having length in the axial direction and defining a bore, with said opposite ends being adjacent and circumferentially spaced thereby defining a gap that extends generally lengthwise and circumferentially, a cage disposed in said bore and defining therewith continuous ball raceways distributed circumferentially with a plurality of balls disposed in said raceways, the improvement comprising connection means interconnecting one of said adjacent ends with the other of said ends for permitting limited relative movement of these ends and correspondingly limited variation of said gap in the circumferential direction, and correspondingly limited variation of the bore diameter of said outer race sleeve.

10. An outer race for a rolling bearing, comprising a flat plate having opposite ends, said plate being curved to form a split sleeve, the inside of said plate including a plurality of

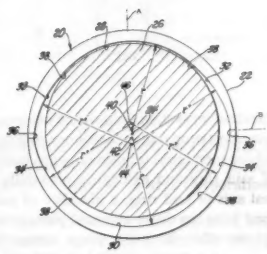


raceways formed directly on said plate to accommodate rolling elements, said opposite ends having respective mating linking means adapted to be linked together to complete said sleeve, said linking means comprising a mechanical interconnection having a limited circumferential play.

4,311,349
SLEEVE BEARING

Arden J. Roberts, Warren, Mich., assignor to Federal-Mogul Corporation, Mich.

Filed May 27, 1980, Ser. No. 153,247
Int. Cl.³ F16C 33/10
U.S. Cl. 308—122 11 Claims

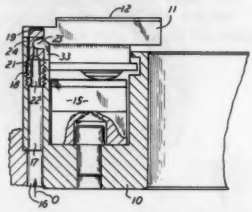


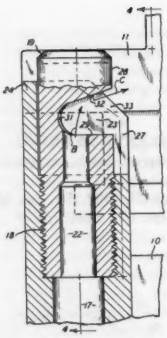
8. A sleeve bearing half shell having an outer cylindrical surface concentric to a center (24) and an inner bearing surface for surrounding a cylindrical journaled member (26) in close spaced relationship therewith, said inner bearing surface having a centrally disposed crown surface (28) divided by a dividing diameter (A) and first clearance surfaces (32) on each extremity of said crown surface (28), said crown surface (28) extending circumferentially on a first radius (r) which closely approximates the radius of the journaled member (26), said clearance surfaces (32) extending circumferentially on a second radius (r') which is greater than said first radius (r), characterized by said first radius (r) for said crown surface (28) having a first axis (40) on said dividing diameter (A) spaced from said center (24) and said second radius (r') for said clearance surfaces (32) having a center (44) on said dividing diameter (A) spaced on the opposite side of said center (24) from said first axis (40).

4,311,350
LUBRICATION SYSTEM FOR A THRUST BEARING

Allen W. Salzman, Racine, Wis., assignor to Marchem Products Company, Houston, Tex.

Filed Sep. 4, 1980, Ser. No. 184,037
Int. Cl.[3] F16C 17/06
U.S. Cl. 308—160 6 Claims



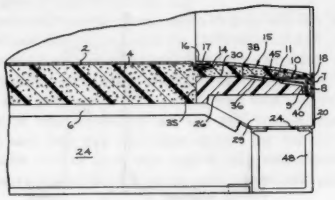


1. In a lubrication system for a thrust bearing which frictionally supports a rotating collar, a retainer ring having a plurality of circularly spaced apart oil passageways in the outer circumference of said ring and extending co-axially relative to the longitudinal axis of said ring, a plurality of pads spaced apart with one pad between every two said passageways and extending to a plane offset from the plane across the ends of said passageways and being in contact with said collar, the improvement comprising said oil passageways being threaded openings, an oil nozzle having threads on one end and being threaded into each of said passageways and having a single oil passageway extending therethrough to direct oil from said passageways and to said collar, each of said nozzles having its said single passageway terminate in only a single oil outlet directed obliquely of the longitudinal axis of the threads on said nozzle and to one side of said nozzle and toward said collar, said nozzle outlet having deflective surface defining said oil outlet and extending oblique to said nozzle axis and aimed at said collar, and said nozzles having a screw driver slot in the end thereof opposite said one end and with the longitudinal direction of said slot being aligned with said one side of said nozzle for positioning said nozzle on said ring to direct the oil toward the one of said pads which is in the rotationally progressive direction of rotation of said collar and thereby assure optimum distribution of the oil relative to said collar and said pads.

4,311,351
REFRIGERATOR CABINET CONSTRUCTION

Tsung K. Chang, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 20, 1980, Ser. No. 132,015
Int. Cl.[3] F25D 11/00; B29D 9/00
U.S. Cl. 312—236 10 Claims

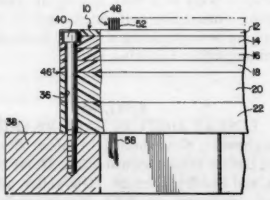


1. A refrigerator cabinet comprising:
an outer shell having an opening at the front thereof;
an inner liner within and spaced from said shell and bonded thereto by a body of foamed plastic insulating material formed in the space between said shell and liner after assembly of said liner within said shell;
a breaker strip interconnecting the outer shell and inner liner; and
a rigid foam member located in the space between the shell and liner underlying the breaker strip and between the insulating material and shell opening, said rigid foam member having a passage for venting air from the insulation space during foaming of the insulation material, said passage being undulated sufficiently to prevent the foam insulation material from passing therethrough.

4,311,352
APPARATUS FOR EFFECTING ELECTRICAL CONNECTIONS WITH MULTIPLE CONTACT POINTS

Ralph W. Kochsmeier, Harrisonville, Mo., assignor to DIT-MCO International Corporation, Kansas City, Mo.

Filed May 30, 1980, Ser. No. 154,924
Int. Cl.[3] H01R 13/24
U.S. Cl. 339—18 R 26 Claims



1. In apparatus for effecting concurrent, respective, forceful engagements to make electrical connections with each of a multiplicity of generally coplanar, electrically conductive zones arranged in a permisssably irregular pattern upon an electrical device such as, for example, a printed circuit board to be tested:
an electrically insulative holding assembly having a pair of oppositely facing, substantially flat surfaces thereon and provided with a multiplicity of holes extend therethrough and oppositely communicating with said surfaces,
said holes having respective central axes and including a particular hole corresponding with each of said zones respectively,
said holding assembly being adapted for disposition relative to said device in an operative position juxtaposing one of said surfaces in facing relationship with said zones with said axes of said particular holes in respective alignment with corresponding ones of said zones;

a multiplicity of electrically conductive contactor assemblies, including a contactor assembly for at least each of said particular holes respectively, each having a base portion mounted in a corresponding hole and a contacting portion extending from said base portion and away from said one surface in a direction substantially aligned with said axis of the corresponding hole for forceful engagement of said contacting portions with said device, including forceful engagement of said contacting portion of each of said contactor assemblies mounted in one of said particular holes with a corresponding one of said zones, when said holding assembly is in said operative position;

a reinforcing assembly having a substantially flat face thereon and provided with a plurality of openings extending therethrough and communicating with said face,

said openings having respective central axes,

at least certain of said openings having a larger, transverse, cross-sectional size than said holes;

means for securing said holding and reinforcing assemblies in a predetermined interengaged relationship to each other with said face of said reinforcing assembly in backing engagement with the other of said surfaces of said holding assembly,

the arrangement of said axes of said holes, the arrangement of said axes of said openings and the relative, lateral, cross-sectional sizes of said holes and said openings being such that, when said holding and reinforcing assemblies are in said predetermined relationship thereof, the extremity of each of said openings adjacent said face is in communication with the extremity of a plurality of said holes adjacent said other surface; and

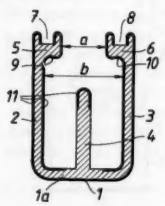
electrically conductive, connecting means for each contactor assembly respectively, electrically coupled with said base portion of the latter and extending therefrom through the opening communicating with the hole in which the corresponding contactor assembly is mounted to a location at which said connecting means is adapted for being coupled with external electrical circuitry.

4,311,353

SWITCHGEAR BUS AND CONNECTION STRUCTURE

Bo Adlerteg, Vesteras, Sweden, assignor to Asea AB, Vesteras, Sweden

Filed Mar. 10, 1980, Ser. No. 128,825
Claims priority, application Sweden, Mar. 15, 1979, 7902316
Int. Cl.³ H01R *13/20*
U.S. Cl. 339—22 R **11 Claims**



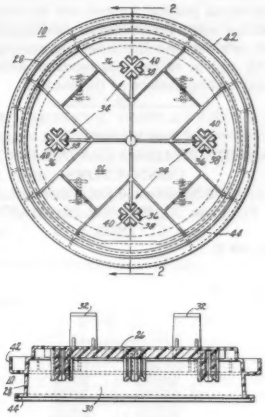
1. The combination of a semi-protected busbar and an electrical coupling device for establishing electrical contact with the busbar, wherein said busbar is in the form of an elongated bar of channel section comprising a base and two spaced-apart outer branches projecting from the same side of the base, each of said outer branches having a thickened edge portion along its edge remote from the base, each of said thickened edge portions having an outwardly-facing open slot extending therealong with a bottom constituting a first contact surface for said coupling device of the screw connection type, and at least one internal surface of the busbar constituting a second contact surface for said coupling device of the plug-in type, and surfaces of said busbar other than said first and second contact surfaces are provided with an electrically insulating coating.

4,311,354

METER DISCONNECT ADAPTOR

Darrell Robinson, Milford, and John C. Bell, Livonia, both of Mich., assignors to Ekstrom Industries, Inc., Farmington Hills, Mich.

Filed Mar. 12, 1980, Ser. No. 129,571
Int. Cl.³ H01R *13/44, 13/60*; G01R *11/04*
U.S. Cl. 339—36 **6 Claims**



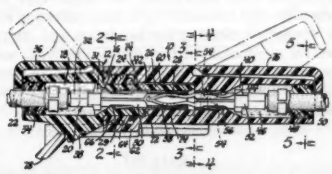
3. An adaptor for assembly into an electric meter socket in place of an electric meter, comprising a base and a peripheral wall on the base, said wall having mounting means for enabling assembly into a meter socket and means on the forward end thereof for enabling the mounting of an electric meter, means extending rearwardly from the base for frictional engagement in meter socket terminals, and means extending forwardly from the base for receiving and frictionally retaining the contact blades of an electric meter.

4,311,355

WEATHERPROOF ELECTRICAL CONNECTOR

Robert G. Plyler, Vienna, and John A. Yurtin, Southington, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 953,410, Oct. 23, 1978, abandoned.
This application Apr. 9, 1980, Ser. No. 138,809
Int. Cl.³ H01R *13/52*
U.S. Cl. 339—94 R **10 Claims**



1. An interface sealing arrangement for matable electrical connectors comprising:

a plug connector body having an open ended cavity which extends therethrough in a longitudinal direction and has a portion defined by a longitudinal tower at one end of the connector body,

a female terminal having an elongated socket at one end retained in the cavity with the elongated socket disposed in the portion defined by the tower,

a socket connector body having an open ended cavity which extends therethrough in a longitudinal direction and has an enlarged portion at one end which slidably receives the tower of the plug connector body, said socket connector body having a longitudinal projecting shroud at said one end providing an internal peripheral sealing surface forward of and spaced radially outwardly of the enlarged portion of the cavity,

a male terminal having an elongated contact at one end retained in the cavity with the elongated contact disposed in the enlarged portion thereof and inserted in the elongated socket when the connector bodies are mated, and

a seal pad mounted on the tower in sealing engagement therewith and in sealing engagement with the internal peripheral sealing surface of the shroud.

4,311,356

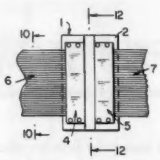
TRANSDUCER HEAD HAVING PIN TYPE CONNECTORS

Myron B. Levitt, 55 Maplewood Dr., Plainview, N.Y. 11803

Filed Jan. 23, 1980, Ser. No. 114,575

Int. Cl.³ H01R *4/24*

U.S. Cl. 339—99 R **23 Claims**



1. In a transducer head arrangement comprising a housing having a plurality of information reading and/or writing means therein;

the improvement comprising the combination of:

a connector fixedly mounted to said housing and including an insulating member and a plurality of electrically conducting connecting elements which extend through said insulating member so as to extend from inside said housing to the outside of said housing, said connecting elements being connected to said information reading and/or writing means inside of said housing, the portions of each of said connecting elements extending outside said housing having means for piercing insulation covering an electrical wire and for electrically contacting the wire covered by the pierced insulation;

a substantially flat ribbon-type multi-conductor wire having insulation surrounding each conductor and separating the conductors from each other, the ribbon-type wire being pressed on said connector with the connecting elements of the connector piercing the insulation and contacting respective conductors of the ribbon-type wire; and

cover means coupled to said connector to cover and enclose said connecting elements and the pierced portion of the ribbon-type wire.

4,311,357

ANNULAR SCANNING LIGHT PULSE SYSTEM

Paul W. Lang, Long Beach, Calif., assignor to Raymus K. Payton, Newport Beach, Calif.

Filed Sep. 8, 1980, Ser. No. 185,144

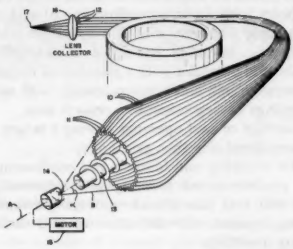
Int. Cl.³ G02B *27/17*

U.S. Cl. 350—6.9 **7 Claims**

1. An annular scanning light pulse system including, in combination:

(a) means defining a series of light paths having individual light entrance ends arranged in a circle and light exit ends, the lengths of said paths successively decreasing from one path to the next adjacent path;

(b) means for cyclically sweeping a light beam in a circular locus to successively impinge on the light entrance ends of the paths, the time for light to travel the difference between successive path lengths corresponding to the time of scan from one light entrance opening to the next succes-



sive light entrance opening by said light beam so that light passes from the light exit ends of said paths substantially simultaneously; and

(c) light collecting and converging means positioned to intercept the light emanating from said exit ends to cause the light to converge to a given focal point so that a high intensity light pulse occurs at said focal point when light emanates from each of said exit ends.

4,311,358

ILLUMINATION DEVICE FOR FLUORESCENCE MICROSCOPES

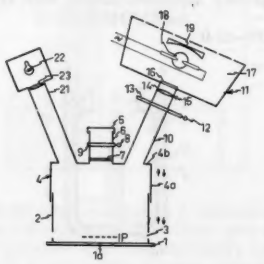
Gregory C. Gibbons, Virum, and Lars Munck, Helsingor, both of Denmark, assignors to De Forenede Bryggerier A/S, Denmark

Filed Oct. 25, 1979, Ser. No. 88,320

Claims priority, application Sweden, Nov. 1, 1978, 7811307; May 10, 1979, 7904091

Int. Cl.³ G02B *21/16*

U.S. Cl. 350—91 **9 Claims**



1. An illumination device for a miroscope, permitting use of the microscope as a fluorescence microscope, said device comprising:

a first tube member having a first end adapted for light-tight connection to a microscope objective, a second end adapted for attachment to the stage of the microscope to enclose a sample thereon, and a light-screening wall portion joining said first tube member first end and second end and having therein means permitting introduction of a sample onto the stage, one of the first tube member first end and wall portion having at a distance to one side of said light-tight connection a first opening;

a second tube member having a first end coupled to said first

opening, a second end, and a light-tight wall portion joining said second tube member first end and second end; and

a light source connected to said second tube member second end for directing light therefrom through said second tube member and said first opening towards said first tube member second end to illuminate the stage of the microscope and any sample thereon.

4,311,359

CONNECTING A LIGHT-CONDUCTING FIBER, FIBER BUNDLE, OR LIGHT PIPE TO A LIGHT-EMITTING OR LIGHT-RECEIVING ELEMENT

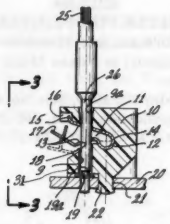
Gerhard Keller, Vaterstetten, Fed. Rep. of Germany, assignor to Schaltbau Gesellschaft mbH, Munich, Fed. Rep. of Germany

Filed Feb. 27, 1980, Ser. No. 124,972

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1979, 2907705

Int. Cl.³ G02B *7/26*

U.S. Cl. 350—96.20 **6 Claims**



1. A connector socket for connecting the end of a light-conducting element, such as a light-conducting fiber or fiber bundle, to the window of a light-emitting or light-receiving circuit element on a carrier, or the like, such as a printed circuit board, comprising:

a support element provided for connection to the carrier adjacent to said circuit element, and having a bore for being situated above said circuit element, at least a portion of the bore having a diameter to match the diameter or outer dimensions of the light-conducting element,

a leaf spring mounted to said support element, and having a leg being deflectible in at least a direction away from said bore, the leg extending above said bore; and

a bore in the leg of the spring and being situated in the leg so that the bore of the spring leg is aligned with the bore in the support element upon deflecting the leg in said direction so that, following receiving the light-conducting element while deflected, the leg is provided to urge the light-conducting element toward said window of said circuit element, when the support element is affixed to the carrier and the window faces the bore in the support element.

4,311,360

LASER BEAM POWER MULTIPLICATION

Donald R. Hodson, and Norbert A. Massie, both of Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

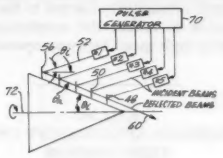
Filed Apr. 7, 1980, Ser. No. 138,057

Int. Cl.³ G02B *27/14*

U.S. Cl. 350—174 **8 Claims**

1. Light beam collecting and distributing apparatus comprising:

a rotor, means for rotating the rotor at a predetermined angular velocity, a plurality of mirrors, and means mounting the mirrors on the rotor with the mirrors positioned with the reflecting surfaces lying in a plurality of parallel planes perpendicular to the axis of rotation of the rotor, there being at least one mirror surface in each of said



planes, the mirrors in successive planes being positioned at radially greater distances from the axis of the rotor.

4,311,361

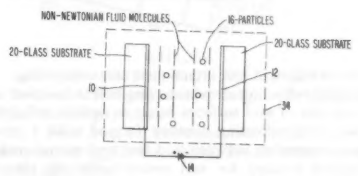
ELECTROPHORETIC DISPLAY USING A NON-NEWTONIAN FLUID AS A THRESHOLD DEVICE

Arpad Somlyody, Mendon, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 13, 1980, Ser. No. 129,892

Int. Cl.³ G02F *1/29*

U.S. Cl. 350—267 **7 Claims**



7. An electrophoretic matrix display panel comprising a plurality of electrophoretic display elements arranged in an X-Y matrix, each of said plurality of display elements containing a non-Newtonian solution solely capable of activation by a pair of simultaneous signals whose sum exceeds a predetermined threshold level.

4,311,362

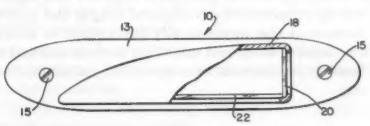
TWO-POSITION AERODYNAMIC MIRROR

Thomas A. LaPorte, 10705 Nadine, Huntington Woods, Mich. 48070

Filed May 2, 1980, Ser. No. 146,035

Int. Cl.³ G02B *5/10*

U.S. Cl. 350—293 **9 Claims**



1. A city-highway rear view mirror having reduced aerodynamic drag for high speed highway operation of a vehicle comprising:

support means adapted to be rigidly mounted to an external surface of a vehicle;

a mirror assembly having a first mirror, a second mirror disposed at an angle to said first mirror, and an axis of rotation parallel to the surfaces of said first and second mirrors, said first mirror having a surface area substantially larger than the surface area of said second mirror; and

indexing means rigidly supporting said mirror assembly from

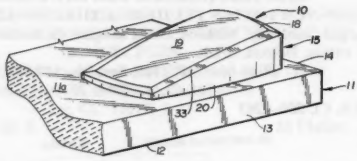
said support means for permitting said mirror assembly to be rotated about said axis between a city position with said first mirror disposed substantially normal to the vehicle's direction of motion and a highway position with said second mirror substantially normal to the vehicle's direction of motion to reduce the aerodynamic drag of the mirror during high speed highway operation of the vehicle.

4,311,363

AUXILIARY MIRROR ATTACHMENT UNIT FOR REAR VIEW MIRROR

Joseph P. Marsalka, and John P. Kennedy, both of Columbus, Ohio, assignors to Mirrorcraft, Inc., Columbus, Ohio

Filed Apr. 30, 1979, Ser. No. 34,292
Int. Cl.³ G02B *7/18*
U.S. Cl. 350—299 **20 Claims**



1. An auxiliary mirror attachment unit comprising

an optical reflecting element having first and second surfaces with one of said surfaces being an optical reflecting surface, said reflecting element formed with a peripheral edge extending between said first and second surfaces,

a support housing for said optical reflecting element for support thereof in predetermined relationship to a mounting surface, said support housing including a mounting base having a base surface which is adapted to be disposed in superposed relationship to a mounting surface in secured relationship thereto and a support wall formed with the mounting base in laterally projecting relationship thereto, said mounting base having an adhesive material applied thereto for adhesive bonding of the unit to a mounting surface, said support wall being of continuous extent defining a closed loop with an inwardly facing surface and of a configuration to receive said optical reflecting element therein with the peripheral edge of said reflecting element in contacting engagement with the inner wall surface of said support wall, said support wall being formed from a material having a characteristic resilience to permit assembly with said optical reflecting element,

said reflecting element peripheral edge and said support wall having cooperatively configured tongue and groove conformations that mechanically interengage in interlocking relationship when said reflecting element and said support housing are disposed in cooperatively assembled relationship.

4,311,364

CAMERA FILTERS AND A METHOD OF MAKING THE SAME

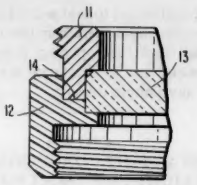
Reiji Motomura, Tama; Hirofumi Ohta, Hachioji; Takashi Matsuura, Oume, and Kou Itaya, Tokorozawa, all of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Apr. 29, 1980, Ser. No. 145,178
Claims priority, application Japan, Aug. 29, 1979, 54/109180
Int. Cl.³ G02B *7/00*; B29C *27/08, 27/10*
U.S. Cl. 350—318 **10 Claims**

1. A filter for a camera comprising:

a filter plate; and

a frame plate made of a synthetic resin and holding said filter plate therein, said frame being composed of an internally threaded front portion, and an externally threaded rear portion adapted for attachment to a lens holding tube of



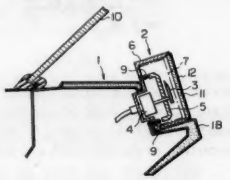
the camera, said front and rear portions being separate elements and being integrally connected to each other so as to hold said filter plate therebetween.

4,311,365

METER FOR VEHICLES

Hiroshi Tsuda, Yokohama, and Masahiro Adachi, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 30, 1979, Ser. No. 43,701
Claims priority, application Japan, Jul. 29, 1978, 53-92890
Int. Cl.³ G02B *27/28, 27/02*
U.S. Cl. 350—399 **3 Claims**



1. A vehicle having a windshield, a meter, a housing containing therein said meter and a light source; and having a light polarizing window immovably fixed to the front of said housing,

said housing being oriented with respect to said windshield so that maximum attenuation of the polarized light, emitted from said meter and reflected off said windshield, is achieved, said window further having an external surface which is non-reflecting.

4,311,366

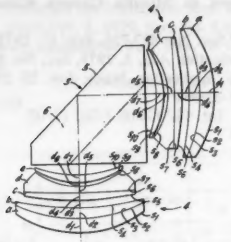
IMAGE FOCUSING SYSTEM

Alan D. Clark, Little Chalfont; Richard P. Harvey, Amersham, and Colin A. Leming, Edgeware, all of England, assignors to J. H. Dallmeyer Limited, London, England

Filed Feb. 28, 1979, Ser. No. 16,105
Claims priority, application United Kingdom, Mar. 1, 1978, 8165/78
Int. Cl.³ G02B *9/62, 17/04*
U.S. Cl. 350—445 **7 Claims**

1. An image focusing system comprising two lens assemblies defining an optical axis; and a reflecting element for folding said optical axis of the system and disposed between said lens assemblies; wherein each lens assembly comprises a plurality of lens elements having optical surfaces of which at least some are air-to-glass surfaces, said optical surfaces being arranged in a first group having a negative power and being disposed closer to the reflecting element and in a second group having a positive power and disposed further from the reflecting element,

the ratio of the powers of the second group to the first group being within the range from −1:1 and −3:1, and wherein all



said air-to-glass surfaces are concave towards said reflecting element.

4,311,367

WIDE ANGLE PHOTOGRAPHIC LENS

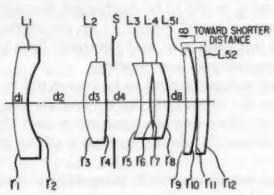
Ikuo Mori, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 15, 1979, Ser. No. 94,725

Claims priority, application Japan, Nov. 15, 1978, 53-139800; Apr. 26, 1979, 54-51977

Int. Cl.³ G02B *13/04*

U.S. Cl. 350—461 **14 Claims**



1. A wide angle photographic lens which can be focused by a simple mechanism, comprising:

a divergent forward group having a negative meniscus lens component having its convex surface facing the object side; and

a convergent rearward group having a diaphragm, a positive lens component disposed forwardly of said diaphragm, a biconcave negative lens component disposed rearwardly of said diaphragm, a positive meniscus lens component having its convex surface facing the image side, all of said lens components of the forward and the rearward groups being fixed with respect to the image plane, and a focusing lens member disposed most adjacent to the image side;

said focusing lens member comprising a lens movable in the direction of the optical axis, and focusing being effected by such movement of said movable lens alone.

4,311,368

LIGHT SHIELDING MATERIAL

Takeshi Saito; Takashi Ueno, both of Ohtsu, and Hideo Kashiwagi, Tokyo, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

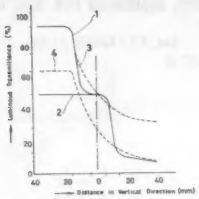
Filed Jun. 8, 1979, Ser. No. 46,629

Claims priority, application Japan, Jun. 8, 1978, 53-69049

Int. Cl.³ G02C *7/10, 7/16*

U.S. Cl. 351—165 **8 Claims**

1. A light shielding material having a gradient of the luminous transmittance (T) in the vertical direction, which comprises at least two regions I and II differing in the luminous transmittance (T), said region I having a width of at least 5 mm in the vertical direction and a luminous transmittance (T) of 30 to 75% under the photopic vision condition, and said region II being disposed above said region I and consecutive thereto and including a portion in which the difference of the luminous



density, expressed in terms of the common logarithm of the reciprocal of the luminous transmittance (T), is at least 0.35 per 10 mm of the vertical distance and a portion in which the luminous transmittance (T) is up to 25%.

4,311,369

SOUND MOTION PICTURE CAMERA

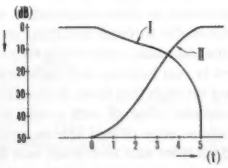
Yutaka Kohtani, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1979, Ser. No. 71,587

Claims priority, application Japan, Sep. 8, 1978, 53-111063; Sep. 8, 1978, 53-111065

Int. Cl.³ G03B *21/36*

U.S. Cl. 352—91 C **12 Claims**



1. A sound overlap device for a motion picture camera comprising:

(a) fade out signal forming means for forming a fade out signal so as to start a fade out process during a photographic overlap operation;

(b) fade in signal forming means for forming a fade in signal so as to start a fade in process during the photographic overlap operation;

(c) sound-to-electric converting means for converting sound into electrical sound siganls;

(d) a sound recording member for recording the sound signals on a sound recording medium;

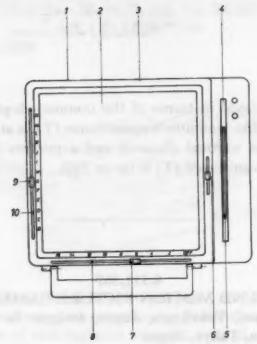
(e) a bias producing circuit for biasing the sound recording member with a bias of predetermined level for a fade out process and, in response to the fade in signal, for biasing the sound recording member for a fade in process with a gradually increasing bias;

(f) a sound level control circuit coupled to said converting means and to be actuated to the fade out signal for gradually decreasing the sound signal only after a predetermined period of time from the actuation and for gradually increasing the sound signal in response to the fade in signal.

4,311,370
FILM READER

Hermann Poehler, Taunusstr. 11, 6352 Ober-Mörlen, and Peter Dziemba, Ahornweg 17, 6351 Wisselsheim, both of Fed. Rep. of Germany

Filed Nov. 7, 1979, Ser. No. 92,427
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1979, 2926059
Int. Cl.³ G03B *21/00, 23/00*
U.S. Cl. 353—27 R 2 Claims

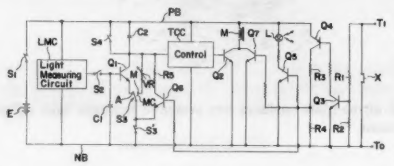


1. A film reader including a housing defining a front wall, a rectangular screen arranged in the front wall, a projector having an illumination plane enclosed in said housing, and a film holder accessible through said front wall and being guided in said illumination plane, comprising two control levers movably arranged in said housing and each having a free end portion extending through said front wall, one of said levers being movable alone one edge of said screen and the other lever along a transverse edge of said screen; reversing transmission means linked between said levers and said film holder to move the same at a reduced speed in said illumination plane in direction opposite to the directions of movement of said levers whereby the directions of movement of the film image projected on said screen correspond to those of said levers, said film holder including a longitudinal carriage movable in one direction and a transverse carriage supported on said longitudinal carriage for movement transverse to that of the latter and being adapted for supporting a film to be projected; one of said control levers being rotatable about a fixed pivot point and at the same time guided for longitudinal displacement relative to said fixed pivot point; an equalizing lever hinged to said one control lever and being pivotable about another fixed pivot point; said one control lever being movable in a plane transverse to said illumination plane; said equalization lever being an elbow lever the apex of which is pivotable about said fixed pivot pin; one of the arms of said elbow lever being hinged to said one control lever; said transmission means including a transmission lever extending across said one control lever and being pivotable at one end thereof about a fixed pivot pin and being linked at the other end thereof to a pivot pin on said longitudinal carriage of said film holder; the end portions of said transmission lever including oblong slots engaging respective pivot pins to permit the displacement of said transmission lever along its longitudinal axis; and the other arm of said equalizing elbow lever being hinged to said transmission lever.

4,311,371
EXPOSURE CONTROL SYSTEM FOR CAMERA

Toshio Kobori, Sakai, and Masayoshi Sahara, Sennan, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 807,726, Jun. 17, 1977, abandoned.
This application Aug. 3, 1979, Ser. No. 63,552
Claims priority, application Japan, Jun. 25, 1976, 51-75783; Oct. 21, 1976, 51-126990
Int. Cl.³ G03B *7/00, 15/05*
U.S. Cl. 354—34 6 Claims



1. An electronic flash exposure control means for use in a photographic camera in which the exposure time is achieved by means of a two-curtain type focal plane shutter including leading and trailing curtains movable between released and cocked positions, utilizable in combination with an electronic flash device having an electric energy storing means producing an electrical signal indicative of the energy stored therein, a flash tube and a trigger means for firing the electronic flash device by causing the electric energy stored in said electric energy storing means to be discharged through said flash tube to illuminate a target object to be photographed with flash light from said flash tube, said electronic flash exposure control means comprising in combination:

a closing means adapted to be connected to the focal plane shutter for closing the focal plane shutter;

a first switching circuit connected to said closing means for controlling the closing operation of the focal plane shutter;

a second switching circuit connected to said closing means and said first switching circuit including a shutter closing inhibit means responsive to the electrical signal indicative of the energy stored in the electric energy storing means connected to said first switching circuit for inhibiting the controlling operation of said first switching circuit when said electric energy stored in the electric energy storing means exceeds a predetermined voltage and a closing control means connected to said closing means for causing said closing means to close the focal plane shutter in response to the firing of the electronic flash device;

wherein said first switching circuit includes a time determining circuit for determining a period of time, a first control means connected to said time determining circuit for generating a first output signal after said period of time determined by said time determining circuit, and wherein said closing means includes an electromagnet means connected to said first control means for connection to the trailing curtain of the focal plane shutter for retaining the trailing curtain in the cocked position and for releasing the trailing curtain to allow the latter to move towards the released position in response to the application of said first output signal from said first control means; and

wherein said closing control means comprises a second control means responsive to the electrical signal indicative of the energy stored in the electric energy storing means for generating a second output signal when the energy stored in said electric energy storing means is less than said predetermined amount, said second control means being connected to said electromagnet means for releasing the trailing curtain, and wherein said shutter closing inhibit means includes means for causing control of said electromagnet means by said first control means to be inoperative.

4,311,372
COMPUTER CONTROLLED ELECTRONIC FLASH

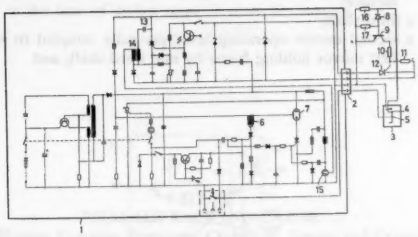
Egon Gahler, Hattersheim, Fed. Rep. of Germany, assignor to Braun AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 5, 1979, Ser. No. 9,697

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1978, 2804886

Int. Cl.³ G03B *15/05*

U.S. Cl. 354—33 **3 Claims**



1. An electronic flash unit for use with a camera having flash unit connecting terminals and a sensor which senses light entering through a camera lens and which issues a signal to said terminals when the light reaches a threshold value, said flash unit comprising a first section including a flash tube; a second section including an internal light sensor which senses flash light reflected from an object to be photographed and circuit means for supplying the electrical energy to the flash tube to fire the same including a firing transformer for said flash tube, and an electronic switch having a control electrode and being connected in series with said flash tube for terminating the supply of electrical energy thereto when the light sensed by one of said sensors reaches a threshold value, the connecting terminals of the camera including a first terminal which is operative for triggering a flash and at least indirectly connectable with said firing transformer, and a second terminal which is operative for terminating the flash and at least indirectly connectable with said control electrode; and an adapter circuit operative for connecting said second section of said flash unit with the connecting terminals of the camera, including a diode and a transistor having a base connected to said diode and a collector connected with said control electrode, said circuit means including a primary winding of said transformer and a capacitor connected to discharge across said primary winding, and a secondary winding of said transformer and a further electronic switch in circuit with said secondary winding and the first-mentioned electronic switch, the second terminal of the camera producing said signal in form of a negative potential which is supplied via said diode to said base of said transistor so that the transistor forwards a signal to said further electronic switch which causes said capacitor to discharge across said primary winding with resultant generation of a current pulse in said secondary winding, which current pulse effects operation of the first-mentioned electronic switch to deactivate the flash tube.

4,311,373
PHOTOGRAPHIC CAMERA WITH DRIVING AND STOPPING MECHANISM

Gerhard Kranz, Brunswick, Fed. Rep. of Germany, assignor to Rollei-Werke Franke & Heidecke GmbH & Co. KG, Brunswick, Fed. Rep. of Germany

Filed Sep. 25, 1980, Ser. No. 190,614

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1979, 2939770

Int. Cl.³ G03B *7/08, 9/02*

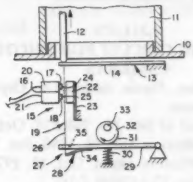
U.S. Cl. 354—43 **20 Claims**

1. A mechanism for a camera having a diaphragm control for an aperture that is typically located in an interchangeable lens unit and means for generating a stop signal when said aperture has a desired opening as a result of said diaphragm control, said mechanism comprising:

a driving element for driving said diaphragm control,

restraining means for restraining the rate of said driving of said diaphragm control by said driving element,

a stop element connecting said driving means to said restraining means, and



a stopping device acting on said stop element to stop said diaphragm control at the desired aperture opening on the occurrence of said stop signal, said stopping device comprising at least one electromagnetic coil and a magnet core at one side of said stop element and an armature plate at the other side of the said stop element, and means for applying said stop signal to activate said coil to brake to a stop by grasping said stop element between said core and plate.

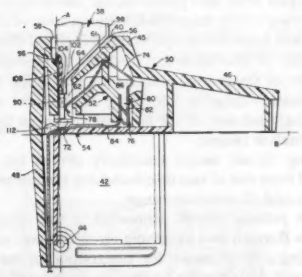
4,311,374
CAMERA FLASH ARRAY AND HOLDER RECEPTACLE

Bruce K. Johnson, Andover, and John B. Morse, Boston, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 5, 1980, Ser. No. 175,423

Int. Cl.³ G03B *15/03*

U.S. Cl. 354—144 **8 Claims**



1. A camera for use with a disposable flash array, the array comprising a relatively thick body portion and a relatively thin blade portion, the body portion enclosing a plurality of flash bulbs, the flash array being an elongated array having its flash bulbs in side by side arrangement, the blade portion carrying a plurality of flash contact terminals, said camera comprising a camera housing, a flash holder mounted on said camera housing for pivotal movement from a folded inoperative arrangement to an erect operative arrangement, said flash holder having a receptacle well including a relatively wide mouth communicating with a relatively narrow slot, said mouth being configured to receive and conform to at least parts of a lower section of the body portion of the flash array, said receptacle mouth being an elongated opening, said flash holder being mounted on said camera housing for pivotal movement around an axis parallel to the longitudinal axis of said mouth opening, said mouth conforming to parts of the forward and rear sur-

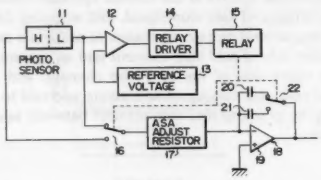
faces of the array, and said slot being configured to receive the blade portion of the flash array when it is operatively positioned in said flash holder whereby when an operator pivots said flash holder from its erect arrangement to its said folded arrangement by grasping the flash array, a major portion of the forces involved are transferred from the body portion of the flash array to said flash holder thereby protecting the thin blade portion from damage.

4,311,375

LIGHT MEASURING CIRCUIT FOR PHOTOGRAPHIC CAMERAS

Tsuyoshi Matsuura, Ina, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 948,528, Oct. 4, 1978, abandoned. This application Apr. 23, 1980, Ser. No. 143,108
Claims priority, application Japan, Oct. 18, 1977, 52/121110
Int. Cl.³ G03B *7/00*
U.S. Cl. 354—60 R **20 Claims**



1. A light measuring circuit for photographic cameras comprising:

a photoelectric converting element for receiving an incident light ray to convert the incident light ray into a photoelectric signal;

a plurality of amplifying circuit which divides a photoelectric signal from said photoelectric converting element in accordance with ranges of the illumination of the incident light and amplifies the photoelectric signal divided;

a plurality of discriminating circuits corresponding to the number of the divided illumination ranges for judging the illumination range to which the illumination of the incident light belongs, at the boundary between the adjacent illumination ranges;

switching circuit means selectively driven by an output signal from one of said discriminating circuits corresponding to said illumination range;

an ASA resistor circuit connected to said discriminating means through said switching circuit means; and

integrating circuit means for integrating an output signal from said discriminating circuit on the basis of an integrating constant selected by said switching circuit.

4,311,376

MIRROR OPERATING MECHANISM FOR SINGLE-LENS REFLEX CAMERA

Keisuke Haraguchi, Ranzan, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 7, 1980, Ser. No. 166,645
Claims priority, application Japan, Jul. 10, 1979, 54/94704[U]
Int. Cl.³ G03B *19/12*
U.S. Cl. 354—153 **6 Claims**

1. A mirror operating mechanism in a single-lens reflex camera comprising:

a mirror box housing;

a first shaft;

a first mirror holding frame holding a half-silvered mirror adapted to split light applied thereto from a photographing lens into a reflected portion and a transmitted portion, said first shaft pivotally coupling said first mirror holding frame to said mirror box housing;

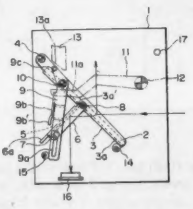
a second shaft;

a second mirror holding frame holding a totally reflecting mirror for reflecting said transmitted portion from said half-silvered mirror, said second mirror holding frame being pivotally coupled to said first mirror holding frame by said second shaft;

a rotation angle control plate coupled to said mirror box housing, said rotation angle control plate having a cam surface;

a third shaft;

a second mirror operating lever pivotally coupled to said first mirror holding frame by said third shaft; and



a fourth shaft rigidly coupled to said second mirror holding frame, one end of said second mirror operating lever being slidably coupled through elongated grooves formed therein to said fourth shaft and the other end of said second mirror operating lever confronting said rotation angle control plate,

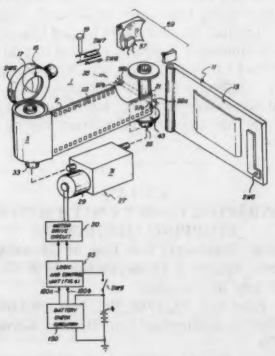
wherein, as said first mirror holding frame is displaced from an observation position to a photographing position, said second mirror operating lever is turned relative to said first mirror holding frame with the aid of said cam surface of said rotation angle control plate to raise said second mirror holding frame with the aid of said elongated grooves of said second mirror operating lever.

4,311,377

IDENTIFYING CASSETTES LOADED IN CAMERAS

Lawrence J. Matteson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 8, 1980, Ser. No. 166,928
Int. Cl.³ G03B *17/36, 17/26*
U.S. Cl. 354—217 **3 Claims**



1. In a photographic camera for receiving a removable filmstrip with associated indicia that identify such filmstrip, and including means for decoding such indicia and for produc-

ing signals corresponding to the indicia, and means for exposing seriatim a plurality of frames on such filmstrip, the improvement comprising:

(a) means for storing said signals when such a film having at least one unexposed frame is removed from the camera; and

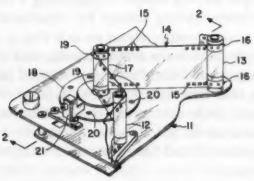
(b) means effective after loading a filmstrip in the camera for comparing the signals associated with such loaded filmstrip with said stored signals to identify receipt in the camera of a filmstrip having at least one unexposed frame at the time of its last removal from the camera.

4,311,378

FILM ADVANCE INDICATOR

E. Thomas Freeman, Poquoson; Charles W. Stump, and Francis W. Dreisbach, both of Hampton, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 18, 1980, Ser. No. 171,934
Int. Cl.³ G03B *17/36*
U.S. Cl. 354—217 **1 Claim**



1. In a camera a mechanism for indicating the advancement of the film comprising:

a circular disc with equally spaced holes lying in a circle concentric with and near to the periphery of said disc, mounted for rotational movement;

a film guide roller means rotationally attached to said disc and in frictional contact with the film for rotating said disc only when the film advances;

a hole detecting means located at a point close to the periphery of said disc for detecting said holes as they move past said point, said hole detecting means is comprised of a light souce positioned close to one surface of said disc at said point and a light detector positioned close to the opposite surface of the disc and in line with the light source so that when the disc moves, the holes pass between the light source and detector and allow the light from the souce to reach the detector, which then sends out a pulse when the light to the detector is interrupted; and

a signal means connected to said hole detecting means for providing an indication of the movement of said holes, wherein the circuit to said signal means includes a Schmitt trigger for shaping the pulses from the sensing means into one pulse per frame;

a counter for counting these pulses;

a means for stretching each of the pulses;

an electronic switch activated by each of the stretched pulses;

an indicator; and

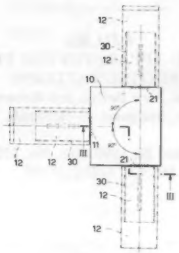
a power source connected to the indicator by the electronic switch during the time said switch is activated.

4,311,379

DEVICE FOR THE SIMULTANEOUS MULTIPLE TRANSFER OF PHOTOGRAPHIC PAPER IN STRIP FORM, FROM ROLL-HOLDER CASSETTES TO DEVELOPERS

Lodovico Falomo, Orcenigo Inferiore, Italy, assignor to Barzano & Zanardo, Milan, Italy

Filed Jan. 25, 1980, Ser. No. 115,383
Claims priority, application Italy, Jan. 29, 1979, 20640/79[U]
Int. Cl.³ G03D *3/08*
U.S. Cl. 354—313 **2 Claims**



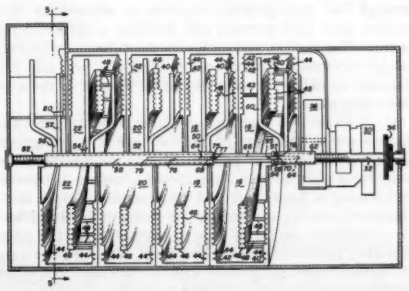
1. A device for transferring exposed photographic paper in strip form from a plurality of roll-holder cassettes, said device comprising walls defining a chamber, said walls having a light-proof frontal slot and two lateral light-proof slots which are symmetrical with respect to the longitudinal axis of the chamber, an internal deflecting apron adjacent each lateral slot shaped so as to deflect a moving strip of photographic paper 90° and simultaneously to turn the moving strip upsidedown, means for mounting a cassette containing photographic paper to each wall in which a slot is located, and transport means in said chamber for transporting strips of photographic paper.

4,311,380

AUTOMATIC PROCESSOR FOR DENTAL X-RAY FILM

James W. Cutter, Hollister, Calif., assignor to DFP Enterprises, Oakland, Calif.

Filed Oct. 10, 1980, Ser. No. 196,013
Int. Cl.³ G03D *3/10*
U.S. Cl. 354—322 **13 Claims**



1. An apparatus for the automatic processing of dental x-ray film comprising:

means forming a spiralling film processing chamber, including at least four revolutions and having its principle axis disposed horizontally, such that one of four tanks suitable for individually retaining fluids is created by the lower portion of each said revolution, said spiralling chamber being defined by sidewalls having at least one pair of opposing arcuate grooves formed therein, each said pair

of arcuate grooves being formed with a constant radius from the central axis of the spiralling chamber;

means forming a film loading port at one end of said spiralling chamber;

means forming a film exit port at the other end said spiralling chamber;

shaft means including a shaft disposed along the principle axis of the spiralling chamber, said shaft being rotatable by a motor; and

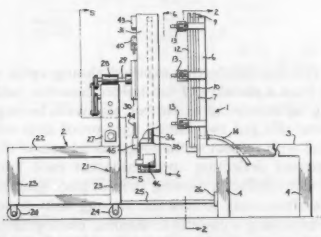
impeller means carried by said shaft means for impelling film from said entry port through said spiralling chamber to said exit port.

4,311,381

METHOD AND APPARATUS FOR PRODUCING PRINTING PATTERNS

Daniel R. Nettesheim, New Berlin, and Robert R. Guyer, Hartland, both of Wis., assignors to Schwaab, Inc., Milwaukee, Wis.

Filed Mar. 24, 1980, Ser. No. 132,816
Int. Cl.³ G03B *27/30*
U.S. Cl. 355—100 **14 Claims**



1. An apparatus for producing printing patterns through use of a liquid uncured photosensitive resin, comprising a supporting structure including a supporting surface disposed at an angle to the horizontal, a transparent plate spaced from the surface to provide a chamber therebetween, a photographic negative containing indicia and disposed on a surface of the transparent plate, resin supply means for introducing a liquid uncured photosensitive resin into the chamber at a level beneath the negative to cover at least a portion of the negative, a lighting unit for exposing portions of the resin in said chamber through the photographic negative to ultra-violet light to thereby cure said portions and produce a hardened pattern having offset indicia, and means for providing relative reciprocating movement between said lighting unit and said support structure to obtain substantially uniform taper on the edges of said offset indicia.

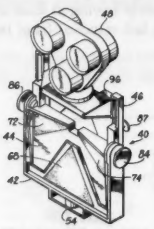
12. A method of producing printing patterns using a liquid photosensitive resin, comprising the steps of mounting a transparent surface in spaced parallel relation to a generally vertical supporting plate to provide a closed chamber therebetween, introducing a liquid uncured photosensitive resin into said chamber, exposing said resin in the chamber to ultraviolet light for a sufficient period of time to partially cure the resin and provide a partially cured backing sheet, removing the transparent surface from engagement with the backing sheet, mounting a photographic negative on said transparent surface and positioning said transparent surface in spaced relation with said supporting plate to provide a second closed chamber therebetween having a greater depth than said first chamber, aligning said negative with said backing sheet, introducing a liquid uncured photosensitive resin into said said chamber, exposing a portion of said resin through said photographic negative to ultra-violet light to thereby crosslink said portion and provide a hardened pattern having offset indicia, removing the pattern from the second chamber, and removing the uncured resin from the pattern.

4,311,382

UNIVERSALLY ADJUSTABLE RANGING TARGET AND RETRO-REFLECTOR HOUSING BRACKET

Galen L. Buckley, Irvine, and Harold W. Martin, Newport Beach, both of Calif., assignors to Pyramid Optical, Inc., Irvine, Calif.

Filed Feb. 4, 1980, Ser. No. 117,859
Int. Cl.³ G01C *3/08;* G02B *17/02, 5/122*
U.S. Cl. 356—5 **10 Claims**



1. A combined sighting target and bracket for receiving a retro-reflecting device for use in conjunction with remotely located electronic distance measuring instruments using a target line-of-sight path and a range measurement path, the combination comprising:

a yoke member having means for rotational engagement with a supporting tripod about an axis that is perpendicular to the surface upon which the tripod stands, said yoke member also having means for defining a first target line,

a tilting member having means for rotational engagement with said yoke member about an axis that is parallel to the surface upon which the tripod stands, said tilting member also having means for defining a second target line that intersects said first target line at a point that is on said line-of-sight path, said point being stationary relative to such measurement instrument irrespective of the rotational position of said tilting member relative to said yoke member, and

an adjusting bracket having means for slideably engaging said tilting member for linear adjustment relative thereto in a direction perpendicular to said second target line, and also having means for receiving a retro-reflecting device, said linear adjustment varying the distance between said retro-reflecting device and said point.

4,311,383

METHOD FOR DETERMINATION OF VELOCITY AND DIRECTION OF MOTION OF MOVING OBJECT BY SPECKLE PATTERNS AND APPARATUS THEREFOR

Junji Ohtsubo, Tanashi, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

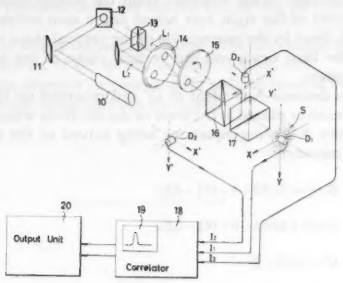
Filed Oct. 4, 1979, Ser. No. 81,870
Claims priority, application Japan, Oct. 9, 1978, 53-124392
Int. Cl.³ G01P *3/36*
U.S. Cl. 356—28.5 **8 Claims**

1. A method for determining the velocity and direction of motion of a moving object by means of speckles moving with the motion of the object, comprising the steps of:

(a) directing two coherent light beams in different directions onto the moving object to produce light scattered by the moving object, and causing the scattered light to form moving speckles in a diffraction plane containing orthogonal X and Y axes;

(b) establishing at least two pairs of spatially disposed sensing points in said diffraction plane, each of said pairs formed from one common point and one associated other point displaced a distance l from said common point, at least one of said pairs disposed along said X axis with its associated other point displaced l_x from said common

point, and at least one other of said pairs disposed along said Y axis with its associated other point being displaced l_y from said common point;



(c) sensing the time variations of the moving speckles for each pair of detectors at said spatially disposed pairs of sensing points and processing said sensed intensities to produce an output signal with a cross-correlation function according to the formula

$$g(\tau,l) = 1 + \exp\left\{ -a^2\beta^2 + \left(\frac{\tau_d}{\tau_c}\right)^2 \right\} \cdot \exp\left\{ -\frac{1}{\tau_c^2}(\tau - \tau_d)^2 \right\} \cdot \cos^2\left(\pi \frac{\tau}{\tau_o}\right)$$

where a is an optical system constant and where the output of the correlation function of the formula consists of the product of three terms, the first being an amplitude decay term, the second being a time-dependent envelope amplitude decay term, and the third being a sinusoid originating from the doppler beat frequency produced by the intensities sensed by any one of said at least two pairs of sensing points, and wherein τ_o is the period of the doppler beat frequency, τ_c is the doppler envelope beat period and τ_d is the time displacement of the peak amplitude of said time-dependent envelope amplitude decay term along an observation interval τ axis referenced to a predetermined observation start time; and

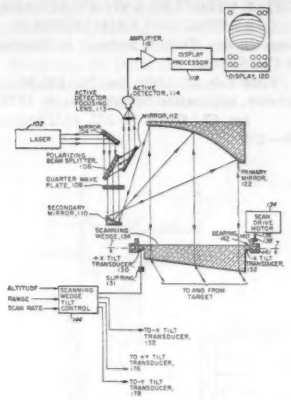
(d) determining the velocity and direction of motion of the moving object in terms of two directional components along said X and Y axes, where the magnitude of each component is obtained by determining the magnitude of the time displacement of the peak amplitude of said envelope decay term from said reference observation start time for the corresponding axis, and the sign of each component is obtained by determining the displacement direction of the peak amplitude of said envelope decay term from the corresponding axis for said reference observation start time.

4,311,384
LASER SCANNING SYSTEM

Wayne H. Keene, Medfield, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Aug. 4, 1975, Ser. No. 601,764
Int. Cl.³ G01B 11/26; G02B 27/17
U.S. Cl. 356—152 **24 Claims**

1. A laser scanning system comprising in combination:
a source of coherent light;
means for producing a scanning beam comprising a rotating wedge with said coherent light;
detector means;
means for producing a reference beam from a portion of said coherent light;
means for receiving a signal return beam; and
means for aligning said reference beam and said signal return

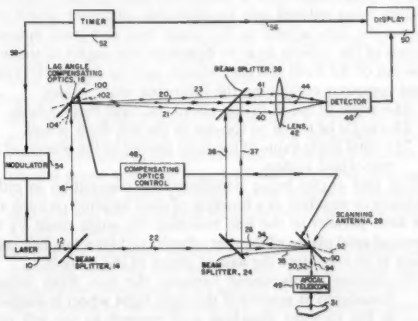


beam upon said detector means comprising means for tilting said wedge along at least one horizontal axis therethrough.

4,311,385
COHERENT DETECTION LAG ANGLE COMPENSATED SCANNING SYSTEM INDEPENDENT OF INHOMOGENEITIES OF THE DETECTOR

Wayne H. Keene, Medfield, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 54,101, Jul. 2, 1979, abandoned. This application Oct. 27, 1980, Ser. No. 200,854
Int. Cl.³ G01B 11/26; G01C 3/08
U.S. Cl. 356—152 **14 Claims**

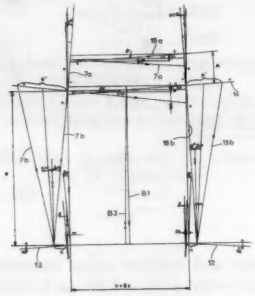


1. A coherent detection scanning system comprising in combination:
scanning antenna means for transmitting and receiving coherent electromagnetic waves;
optical means for aligning the wavefronts of a portion of said transmitted waves and a portion of said received waves with respect to each other;
control means for sequentially driving said optical means to one of a plurality of positions in coordination with the motion of said scanning antenna, each of said positions resulting in alignment of said wavefronts for said portion of waves received from a predetermined range; and
means for projecting said aligned waves on a detector.

4,311,386
METHOD FOR CHECKING WHEEL ALIGNMENT OF FRONT AND REAR WHEEL SYSTEMS OF AUTOMOTIVE VEHICLES AND AN APPARATUS FOR CARRYING OUT SAID METHOD

Paul Coetsier, Chelles, France, assignor to Etablissements M. Muller & Cie, France

Filed Feb. 28, 1980, Ser. No. 126,861
Claims priority, application France, Mar. 9, 1979, 79 06118
Int. Cl.[3] G01B *11/275, 11/27*
U.S. Cl. 356—155 **3 Claims**



1. A method for checking the wheel alignment of the front and rear wheel systems of automotive vehicles as well as for measuring the relative axial displacement or "set-back" of the front wheels, wherein a laser beam emitter is placed at the level of each front wheel and a first laser beam is projected transversely in front of the vehicle onto a first receiver placed in front of the other front wheel whilst a second laser beam produced by the same emitter is projected onto a reflecting mirror placed at the level of the corresponding rear wheel and the second laser beam thus reflected is transmitted to a second receiver, the distance between the point of impact of the laser beam and a zero reference point being then read on each receiver associated with a respective laser emitter, the read values being entered into an electronic computer which processes the data as well as the wheel base and track measurements of the vehicle so as to determine the angles of toe-in or toe-out of the front and rear wheels, and the "set-back" value, said computer computing the following angle values:

$\delta 1$ = angle of toe-in or toe-out of the right front wheel,

$\delta 2$ = angle of toe-in or toe-out of the left front wheel,

2ξ = total angle value of toe-in or toe-out of the wheels of the rear-wheel system,

all of said angles being considered by convention as either positive or negative as a function of their location on each side or lines parallel to the line bisecting the angle made by the vertical axial planes of the rear wheels, said bisecting line being such as to constitute the axis of thrust of the vehicle,

b = relative displacement between the two front wheels, considered as positive if the right front wheel is displaced in the forward direction with respect to the left front wheel and negative in the contrary case, said relative displacement being defined as "set-back",

c = distance between the axial planes of the front wheels and the vertical planes containing the associated laser beams,

v = track,

e = wheel base of the vehicle, the following data being recorded respectively on the first and the second receivers each associated with the respective laser emitter:

D = distance between the point of impact of the first laser beam and the zero reference defined by the point at which the laser impact would be located if the angles of toe-in or toe-out of the front wheels were zero and if the vehicle had zero set-back,

G = distance equivalent to D and recorded on the receiver placed in front of the second front wheel such as the left wheel, for example,

D′ = distance recorded on the second receiver associated with the right front wheel, between the point of impact of the laser beam reflected from the mirror placed at the level of the right rear wheel and a zero reference point defined by the intersection of the vertical plane containing the laser beam and the vertical plane of the second receiver,

G′ = distance equivalent to D′ and recorded on the second receiver placed at the level of the left front wheel, and the four following equations being solved in the electronic computer:

$$D=(v+2c)\delta 2+b+(\delta 1-\delta 2)c$$

$$G+(v+2c)\delta 1-b-(\delta 1-\delta 2)c$$

$$D'=2e(\delta 1-\xi)$$

$$G'=2e(\delta 2-\xi),$$

the solutions of these equations being as follows:

$$\delta 1=\frac{D+G}{2(v+2c)}+\frac{D'-G'}{4e}$$

$$\delta 2=\frac{D+G}{2(v+2c)}-\frac{D'-G'}{4e}$$

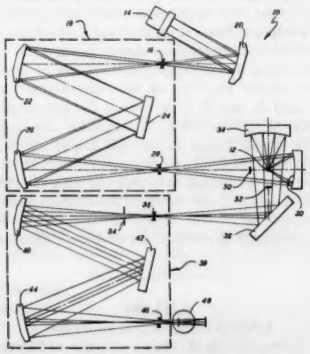
$$2\xi=\frac{D+G}{v+2c}-\frac{D'+G'}{2e}$$

$$b=\frac{D-G}{2}+\frac{v(D'-G')}{4e}.$$

4,311,387
FLOW-THROUGH SAMPLE CELL AND COLLECTING AND ILLUMINATING OPTICS FOR LIQUID CHROMATOGRAPHY

Charles F. deMey, West Redding, and Eugene F. Young, Wilton, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Dec. 14, 1979, Ser. No. 103,788
Int. Cl.[3] G01N *21/64, 21/05*
U.S. Cl. 356—318 **15 Claims**



1. Apparatus for measuring radiation from a sample comprising:

a source of radiation,

a first monochromator for isolating a beam of monochromatic radiation from said radiation source, said first monochromator having an exit slit for passing the isolated excitation beam therethrough,

means for axially focusing the isolated excitation beam passing through said exit slit at the sample including a first

ellipsoidal reflector with the exit slit disposed substantially at one optical focal point and the sample disposed substantially at the other optical focal point,

a second monochromator for isolating a beam of monochromatic radiation from the sample and having an entrance slit,

means for axially focusing radiation from the sample at the entrance slit of the second monochromator, and

a radiation detector for receiving the isolated beam of monochromatic radiation from the sample.

4,311,388

VISIBILITY MEASURING DEVICE

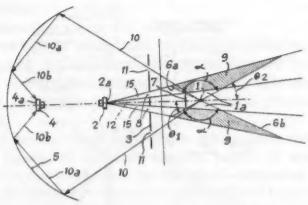
Michel C. Roiret, Massy, and Aime M. Salles, Courbevoie, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Oct. 25, 1979, Ser. No. 88,156

Claims priority, application France, Oct. 30, 1978, 78 30728

Int. Cl.³ G01N *21/00*

U.S. Cl. 356—341 **10 Claims**



1. A device for measuring the visibility or diffusion coefficient of atmospheric ambient air, comprising:

a light source for emitting a direct light beam on a predetermined volume of said ambient air, said light beam diverging in a predetermined solid angle and defining at least one dark cone, outside of said solid angle, in which no direct light beam from said source is directed;

a receiver including at least a first detector which defines an optical axis with the light source, said first detector located in the dark cone and having at least a first entry window also within said dark cone;

wherein the solid angle of the direct light beam extends angularly on substantially both sides of a plane perpendicular to the optical axis and proceeding from the center of said source, such that said first detector receives through said first entry window the light diffused by said volume of air along angles of diffusion distributed within a wide diffusion field which may spread from several degrees up to 170°;

means for averaging the diffused light detected by said receiver so as to counter the influence of the nature of the aerosol on the quantity measured;

said receiver further including a second detector intended to measure the flow of light by said source, said second detector receiving directly a portion of the beam emitted by said source; and

a second entry window for said second detector, said second entry window having an essentially annular shape and surrounding said first entry window.

4,311,389

METHOD FOR THE OPTICAL ALIGNMENT OF DESIGNS IN TWO NEAR PLANES AND ALIGNMENT APPARATUS FOR PERFORMING THIS METHOD

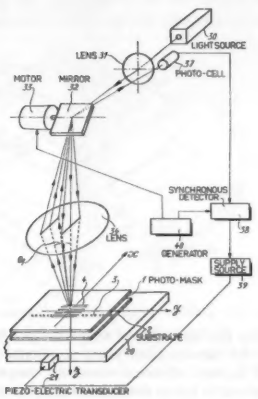
Bernard Fay; Jacques Trotel, and Alain Frichet, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 13, 1979, Ser. No. 75,681

Claims priority, application France, Sep. 19, 1978, 78 26816

Int. Cl.³ G01B *9/02, 11/00*

U.S. Cl. 356—354 **4 Claims**



1. A method for optically aligning designs in first and second near or close planes using marks inscribed on the two planes to be aligned comprising the steps of:

inscribing a mark on the first plane including at least one lens having linear Fresnel zones which are alternately opaque and transparent and perpendicular to the alignment axis in the plane,

inscribing a reflecting mark comprising a single elongated area on the second plane having a central zone perpendicular to the alignment axis, such that the central zone thereof is formed from elements having different reflection coefficients in the direction perpendicular to the alignment direction to form a reflecting amplitude mark with constant spacings in said direction,

illuminating by a parallel mono-chromatic light beam the lens having linear Fresnel zones in such a way as to form in the second plane a light line having substantially the same dimensions as the central zone of the mark inscribed on said plane, the focal length of said lens corresponding to its principal focus of order **1**, the distance separating said first and second planes being chosen equal to the focal length of the lens,

detecting the radiation reflected by said second plane and emerging from the lens having linear Fresnel zones, and

displacing the two planes with respect to one another and in the direction of the alignment axis until the detected radiation passes through an extremum corresponding to the alignment of the two marks.

4,311,390

INTERFEROMETRICALLY CONTROLLED STAGE WITH PRECISELY ORTHOGONAL AXES OF MOTION

Edward H. Phillips, Mountain View, Calif., assignor to Optimetrix Corporation, Mountain View, Calif.

Continuation of Ser. No. 15,713, Feb. 27, 1979, abandoned. This application Oct. 20, 1980, Ser. No. 198,358

Int. Cl.³ G01B *11/00, 11/02*

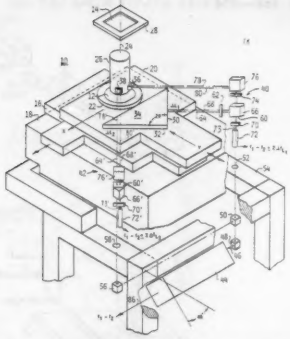
U.S. Cl. 356—358 **40 Claims**

1. A stage movable along orthogonal first and second axes, said stage comprising:

a platform movable nominally along the first and second axes;

first and second reference members mounted on the platform for movement therewith and nominally symmetrically disposed about the first axis in planes intersecting one another nominally at the first axis;

first and second measurement means for producing first and second measurement signals indicative of the movement



of the first and second reference members along first and second measurement paths nominally normal to the first and second reference members, respectively, while the platform is being moved along either the first or the second axis; and

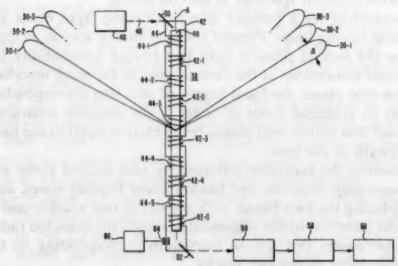
first and second control means responsive to the sum and the difference of the first and second measurement signals for constraining the platform to move along the orthogonal first and second axes.

4,311,391

PASSIVE FIBER OPTIC SONAR SYSTEM

George A. Gilmour, Severna Park, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 27, 1979, Ser. No. 107,800
Int. Cl.³ G01N *21/41*
U.S. Cl. 356—361 **8 Claims**



1. A passive fiber optic sonar detection system, comprising

(A) a first optical fiber winding, having first and second ends and arranged in a plurality of first coils disposed along and about a central axis;

(B) a second optical fiber winding, having first and second ends and arranged in a plurality of second coils disposed along and about said axis;

(C) said first and second coils being alternately arranged along said axis;

(D) a light transmitter optically coupled to said first ends of said first and second optical fiber windings for projecting a light energy beam thereinto;

(E) means for combining the light energy beams which emerge from said second ends of said first and second optical fiber windings;

(F) means for detecting said combined beams and for providing an electrical signal indicative thereof; and

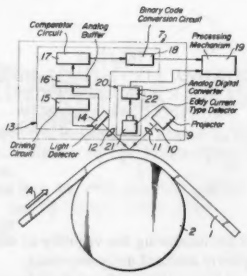
(G) means for analyzing said signal to detect the presence of at least one certain frequency, corresponding to a detecting receiver beam having the form of a hollow cone.

4,311,392

THICKNESS MEASURING APPARATUS FOR NON-METALLIC SHEET-SHAPED BODIES

Susumu Yazaki, Hachioji, and Takeshi Matsumura, Kodaira, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Sep. 9, 1980, Ser. No. 185,641
Claims priority, application Japan, Sep. 21, 1979, 54-120801
Int. Cl.³ G01B *11/06, 11/14*
U.S. Cl. 356—375 **5 Claims**



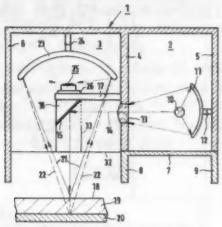
1. A thickness measuring apparatus for non-metallic sheet-shaped bodies, comprising a projector for illuminating the surface of a non-metallic sheet-shaped body engaged with and traveling across a metal roll, a sheet position detecting mechanism including a light detector for receiving an image of the surface of said non-metallic sheet-shaped body and scanning said image, said sheet position detecting mechanism operative to detect the surface position of said non-metallic sheet-shaped body on the basis of the output from said light detector, a roll position detecting mechanism for detecting that surface position of said metal roll which lies near the surface position of said non-metallic sheet-shaped body to be detected, and a processing mechanism for calculating the thickness of said non-metallic sheet-shaped body on the basis of the surface position of said non-metallic sheet-shaped body and of said metal roll as detected by said sheet position detecting mechanism and roll position detecting mechanism, respectively, and delivering said thickness as an output, said projector, sheet position detecting mechanism and roll position detecting mechanism being incorporated into a detection head which is movably mounted on guide shafts extending in a direction perpendicular to the traveling direction of said non-metallic sheet-shaped body, whereby the thickness of said non-metallic sheet-shaped body is measured while said sheet-shaped body travels across said metal roll.

4,311,393

APPARATUS FOR DETERMINING THE REFLECTIVITY OF THE SURFACE OF A MEASURED OBJECT

Rolf Bartke, Sybelstrasse 31, D-4000 Düsseldorf, Fed. Rep. of Germany

Filed Mar. 5, 1980, Ser. No. 127,462
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1979, 2910240
Int. Cl.[3] G01N *21/27;* G01J *3/50*
U.S. Cl. 356—497 5 Claims



1. Apparatus for determining the reflectivity of the surface of a measured object, in particular for determining properties of the measured object which are connected with its reflectivity, comprising

light source means for emitting light along a light path onto the surface of the measured object so that a wide-band light beam impinges onto said surface and is reflected therefrom,

photo-detection means for evaluation,

a concave mirror in the path of the light reflected from the surface of the measured object and focused on the measured object for collecting the reflected light and conveying it to and concentrating it on said photo-detection means,

a pair of narrow-band light filters which pass, respectively, light beams of different narrow bands of wavelengths effective for evaluation by the photo-detection means,

said photo-detection means comprising two separate photo-detectors immediately adjacent each other, side by side, each covered by one of said narrow-band filters, said filters being immediately adjacent each other, side by side, and directly over their respective photo-detectors fixed in their positions relative to said photo-detectors and transmitting their different wavelengths of light to their respective photo-detectors, and

cooling means connected to the photo-detectors and also to said narrow-band filters.

4,311,394

AUTOMATIC ANALYTICAL APPARATUS

Sugio Manabe, Kodaira, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Apr. 9, 1980, Ser. No. 138,518
Claims priority, application Japan, Apr. 12, 1979, 54-44735
Int. Cl.[3] G01N *21/00*
U.S. Cl. 356—440 5 Claims

1. An automatic analytical apparatus for effecting quantitative analysis of given substances in samples comprising

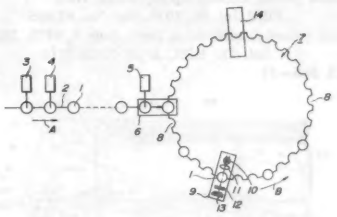
cuvette carrying means for carrying cuvettes successively along a reaction line at a first period H to a sample transferring position;

sample holding and carrying means including a plurality of sample holding positions arranged along a closed loop at a given pitch and carrying said sample holding positions at a second period S through said sample transferring position, a photometering position and a sample discarding position in this order, said second period S being shorter than said first period H;

sample transfer means arranged at said sample transfering position for transferring successively samples contained in the successive cuvettes which are successively fed into said sample transferring positions by said cuvette carrying means, into the sample holding position of the sample holding and carrying means;

photometric means arranged at said photometering position for effecting photometric operation for the samples held and carried by said sample holding and carrying means; and

discarding means arranged at said sample discarding position for discharging the samples out of the sample holding positions of the sample holding and carrying means after



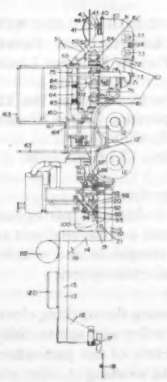
the respective samples in the sample holding and carrying means have been fed along said closed loop by more than one round during which the respective samples have been passed through said photometric means more than twice to effect the photometric operation for the respective samples more than twice; whereby the first period H, the second period S and the number T of sample holding positions of the sample holding and carrying means are so determined that each of the samples successively carried at the sample transferring position can be transferred into vacant sample holding positions.

4,311,395

PIVOTING SKID BLENDER TRAILER

John L. Douthitt, and Gail F. Davis, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jun. 25, 1979, Ser. No. 51,602
Int. Cl.[3] B28C *7/02, 7/14*
U.S. Cl. 366—27 32 Claims



1. A trailer type land vehicle comprising:

a chassis including a load frame portion having axle means and wheel means secured thereto and a U-shaped neck portion secured to the load frame portion; and

an articulated framework pivotally secured about one end of

the load frame portion of said chassis, said articulated framework comprising:

a structure substantially the same shape as the load frame portion of said chassis and pivotally secured to the load frame portion at the juncture of the load frame portion and the U-shaped neck portion.

4,311,396

TRUCK MIXER

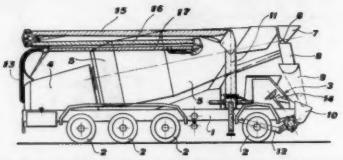
Alfredo Brandi, Dogana, San Marino, assignor to Compagnia Italiana Forme Acciaio S.p.A., Milan, Italy

Filed Jul. 30, 1979, Ser. No. 61,865

Claims priority, application Italy, Aug. 9, 1978, 26617 A/78

Int. Cl.³ B28C *5/20, 5/42, 7/16*

U.S. Cl. 366—51 **3 Claims**



1. Truck mixer designed to allow the operator to carry out direct visual control of the loading and unloading operations of the concrete, of the type in which the concrete mixer is able to discharge the concrete mix processed in it for external use in a direct manner comprising a truck, a driver's cab mounted on the front end of the truck, a mixer mounted on said truck having a loading and unloading mouth mounted above said cab, a concrete collecting tank mounted in front of and below said cab, a chute having a channel communicating with said mouth to discharge concrete either to said concrete collecting tank or to the job, a pumping device mounted on the front of said truck below said cab to receive concrete from said tank, an articulated and orientable arm mounted on said truck and delivery tube mounted on said arm to receive concrete from said pumping device.

4,311,397

PROCESSOR FOR DOUGH WORKING

Edward J. Wright, Chesterton, near Peterborough, England, assignor to Baker Perkins Holdings Limited, Peterborough, England

Filed Feb. 16, 1979, Ser. No. 12,910

Claims priority, application United Kingdom, Feb. 15, 1978, 6039/78; Feb. 15, 1978, 6070/78

Int. Cl.³ B29B *1/06*

U.S. Cl. 366—98 **10 Claims**

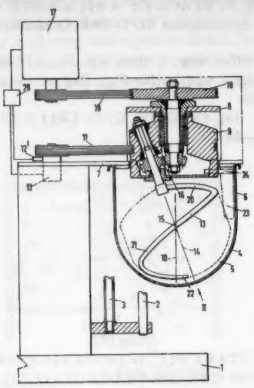
1. A processor comprising:

a working receptacle having a part-spherical internal wall which forms at least a substantial part of the whole internal wall of the receptacle and which forms at least a substantial part of a hemisphere;

a working element;

drive means for rotating the working element relative to the receptacle about a first axis substantially passing through the geometric centre of the part-spherical internal wall and for rotating the working element relative to the receptacle about a second axis inclined to the first axis but also substantially passing through said geometric centre; and

control means for enabling the working element to be driven only about one of said axes, to execute a simple rotary motion, or about both said axes, to execute a planetary motion, the working element having a radially outer surface which is centred on said geometric centre and is close to the part-spherical internal wall so that it generates an



imaginary part-sphere when the working element is rotated about either of said axes.

4,311,398

PRINTER FOR PRODUCING UNIFORMLY SPACED CHARACTERS

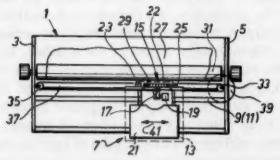
Heinz Gerjets, Wilhelmshaven, Fed. Rep. of Germany, assignor to Olympia Werke Ag, Wilhelmshaven, Fed. Rep. of Germany

Filed Feb. 15, 1980, Ser. No. 121,721

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1979, 2906135

Int. Cl.³ B41J *1/30, 19/30, 29/36*

U.S. Cl. 400—70 **9 Claims**



1. A printer for use in an office machine having a keyboard, said printer serving to produce neatly printed material and comprising: a carriage; a carriage drive supporting said carriage for movement along a line printing path; a typing element carrying type faces of the characters to be printed and movably mounted on said carriage; a typing element drive motor connected to said typing element and controllable from the keyboard for displacing said typing element in steps to bring a selected type face into a printing position; a type striking device positioned to act on the type face in the printing position to effect printing of the associated character on a record carrier medium; and a control device connected to receive signals from the keyboard, to derive therefrom driving pulses identifying each character to be printed, and to transmit those driving pulses to said typing element drive motor for bringing successive selected type faces to the printing position, said control device being operative, immediately after each movement of said typing element to bring a type face into the printing position and before printing of the associated character, for applying to said drive motor at least one driving pulse for displacing said typing element in a predetermined direction over a path of predetermined length and thereafter at least one driving pulse for displacing said typing element in the direction opposite to the predetermined direction and over a path of the same prede-

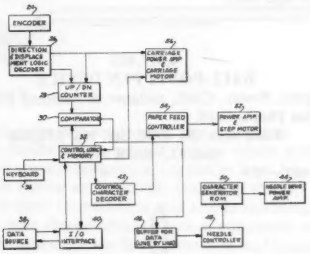
termined length, whereby, prior to each printing operation, said typing element performs a movement having a fixed pattern.

4,311,399

METHOD AND APPARATUS FOR SETTING AND VARYING MARGINS AND LINE SPACING ON DATA PRINTERS

William Wegryn, Ann Arbor, and Juan F. Velazquez, Saline, both of Mich., assignors to Sycor, Inc., Ann Arbor, Mich.

Continuation of Ser. No. 766,242, Feb. 9, 1977, abandoned. This application Jul. 25, 1979, Ser. No. 60,335
Int. Cl.[3] B41J *5/30*
U.S. Cl. 400—76 24 Claims



1. A control system for a data printer of the general type having at least one print head and means for holding printable stock in position relative to said print head for printing thereby, and including means for effectively moving the print head and printable stock relative one another for printing horizontally-aligned characters, said control system comprising:

at least one manually-actuable control key device and means acting in response thereto for producing different particular electrical signals representative of different particular locations in such horizontal alignment of characters;

margin-set means operatively coupled to said control key device and to said means for relatively moving said print head and printable stock, said margin-set means including means conditionable by said different particular electrical signals in response to selective control key actuation so as to index relative movement of said print head and printable stock by limiting ensuing printing to a defined horizontal area ending on opposite side extremities at different particular positions in said horizontal alignment of characters; and

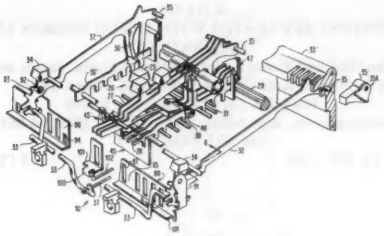
said conditionable means being condition-retaining for printing after initial control key actuation and being condition-alterable by subsequent different particular electrical signals produced upon at least one subsequent different control key actuation and representative of a different position along said horizontal alignment of characters; such that said indexing of relative print head movement may be changed by at least one subsequent control key actuation to a different position than that previously set by control key actuation, such subsequent control key actuation and resultant condition-altering of said conditionable means being operable independently of the position of said print head along said horizontal alignment of characters and during periods of relative print head movement as during printing by said data printer.

4,311,400

SHIFT SENSITIVE DUAL VELOCITY MECHANISM FOR A PRINTER

Mark Loughridge, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 30, 1980, Ser. No. 173,797
Int. Cl.[3] B41J *1/32*
U.S. Cl. 400—166 13 Claims



1. A single print element printer including:

a single print element having a plurality of characters thereon, said print element impacting a record sheet to print a selected character thereon;

velocity control means to control the velocity at which said print element impacts the record sheet to print the selected character;

selection means to select one of the characters on said print element for printing on the record sheet when said print element impacts the record sheet;

said selection means including a plurality of movable means movable in a first direction, each of said movable means being movable in response to selection of one of two characters on said print element with one of the two characters being in one of two cases and the other of the two characters being in the other of the two cases;

shift means to cause said print element to have the selected character in one of the two cases impact the record sheet when one of said movable means is moved in the first direction and said shift means is effective, the selected character in the other of the two cases impacting the record sheet when said one movable means is moved in the first direction and said shift means is not effective;

a member movable from a first position to a second position in a substantially vertical direction and substantially transverse to the first direction when said shift means is effective;

said member including first cooperating means for cooperating with each of said movable means when said member is in its first position and second cooperating means for cooperating with each of said movable means when said member is in its second position, said second cooperating means being disposed above said first cooperating means;

said first cooperating means including causing means engageable by one of said movable means when said one movable means moves in the first direction to cause movement of said member when said print element is to impact the record sheet at a first velocity and enabling means to enable movement of one of said movable means in the first direction without causing movement of said member by said one movable means when said print element is to impact the record sheet at a second velocity;

said second cooperating means including causing means engageable by one of said movable means when said one movable means moves in the first direction to cause movement of said member when said print element is to impact the record sheet at a first velocity and enabling means to enable movement of one of said movable means in the first direction without causing movement of said member by

said one movable means when said print element is to impact the record sheet at a second velocity;

and responsive means responsive to movement of said member by one of said movable means moving in the first direction to engage said causing means of one of said first cooperating means and said second cooperating means to cause said velocity control means to change the velocity at which said print element impacts the record sheet.

4,311,401

PRINTING APPARATUS WITH INKED RIBBON LIFT RESTRAINER

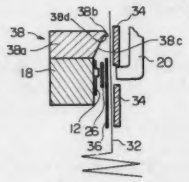
Toshio Hiki, and Kazuo Sugano, both of Katsuta, Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan

Filed Jul. 16, 1979, Ser. No. 57,899

Claims priority, application Japan, May 7, 1979, 54-56190

Int. Cl.³ B41J *35/04*

U.S. Cl. 400—248 **6 Claims**



1. A printing apparatus having a print sheet with folded edges to define forms which are stacked upon each other below the apparatus and arranged to be successively advanced upwardly to a new print line position, comprising a platen, a plurality of print hammers arranged in a horizontal row, a horizontally movable type carrier having a plurality of type characters mounted between said platen and said row of hammers defining therewith a space in which a horizontally movable ink ribbon and a section of said print sheet are disposed in parallel relation, said folded edges of said print sheet having a tendency to make contact with said ribbon upon advancement of the print sheet dragging the ribbon upwardly and displacing said ribbon from a position corresponding to that of said hammers, and a stationary restraining member mounted on said platen to limit the upward movement of said ink ribbon and having a projection extending toward said hammers and an inclined surface extending downwardly from said projection at an acute angle to the surface of said ink ribbon to said platen for making contact with said ink ribbon at said angle when said ribbon is dragged upwardly.

4,311,402

CONTAINER FOR LIPSTICK AND LIKE PRODUCTS

Gilbert Brown, Poole, England, assignor to Edward Webster Limited, West Howe, England

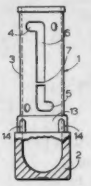
Filed Jan. 25, 1980, Ser. No. 115,387

Claims priority, application United Kingdom, Jan. 27, 1979, 02952/79

Int. Cl.³ A45D *40/12, 40/06*

U.S. Cl. 401—78 **7 Claims**

1. In a container for lipstick and like products comprising a body having a tubular portion, a cup slidably mounted in said tubular portion of said body for axial movement therein, a sleeve coaxial with said tubular portion and manually rotatable relative thereto, said sleeve and said tubular portion of said body having therein respective first and second slots having axial components, a projection on said cup co-operating with both of said slots, and said slots being substantially inclined with respect to each other whereby relative rotation of said sleeve and body results in axial movement of said cup, the improvement comprising a breakable web at an intermediate position in the length of one of said slots, said web being engageable by a projection on said cup to obstruct inadvertent movement of said cup but being breakable by said projection clear of said slot on a manually applied relative rotation of said body and sleeve, said intermediate position of said web being



accurately determined such that when said projection engages said web said cup is fully disposed within the tubular portion of said body and said lipstick is advanced above its fully retracted position so that its tip projects a predetermined distance above the top of said body.

4,311,403

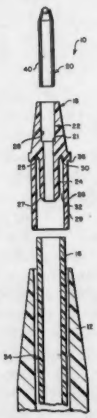
BALL-POINT PEN DEVICE

Tom Liguori, Poway, Calif., assignor to National Pen Corporation, San Diego, Calif.

Filed Mar. 26, 1980, Ser. No. 134,056

Int. Cl.³ B43K *7/00*

U.S. Cl. 401—209 **5 Claims**



1. A ball-point pen device of the type having an outer housing containing a writing portion; said writing portion comprising a cylindrical reservoir tube; a writing tip; a nose piece operable to secure said writing tip to said reservoir in leak-tight relation, said nose piece having defined therethrough a tip receiving conduit; the improvement comprising:

a straight sided inner cylindrical wall defining the rear portion of said tip receiving conduit, the outer diameter of said rear wall being sized to generate a force fit with the inner diameter of said reservoir;

a straight sided outer cylindrical wall disposed concentrically about said inner cylindrical wall and having an inner diameter substantially the same as the outer diameter of said reservoir;

said inner and outer circumferential walls defining therebetween an annular cavity having a width slightly smaller than the width of the walls of said reservoir tube;

said reservoir tube being seated in said annular cavity and

force-fitted over said inner cylindrical wall to be clamped between said inner and outer cylindrical walls;

said conduit having a tip receiving socket with a reduced diameter portion sized to generate a force fit with said writing tip; said tip being received in said socket in force fit relation with said narrowed portion, thereby to hold said tip in said socket.

4,311,404

SPRINKLER BRUSH ASSEMBLY

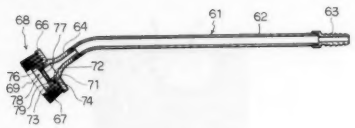
Masao Kodera, 13-2, Mishi-Uratate, Sanjo-shi, Niigata-ken, Japan

Continuation of Ser. No. 881,526, Feb. 27, 1978, abandoned. This application Dec. 19, 1979, Ser. No. 105,380

Claims priority, application Japan, Jul. 7, 1977, 52-90335; Dec. 6, 1977, 52-163615

Int. Cl.[3] **A46B** *11/06;* **B05B** *1/06*

U.S. Cl. 401—287 **1 Claim**



1. A brush assembly comprising, in combination:

a hollow handle having an end portion which is threaded, said end portion comprising a sprinkler head formed with a nozzle having an outwardly extending flange;

an annular plate connected to said nozzle and being formed with a hole therethrough which is concentric with and larger in diameter than said end portion, and being formed with an inwardly extending flange which is sealingly engaged with the flange of the nozzle;

a sprinkler disc carried by said end portion;

sealing means between said nozzle end portion and disc;

a grouping of bristles extending from the plate axially away from the handle;

a resilient diverter tube extending concentrically from said nozzle in alignment with the nozzle and located centrally witin the group of bristles, said tube being formed with a flange at an axially inner end thereof, the axial length of the tube being between $\frac{1}{3}$ and $\frac{1}{2}$ of the length of the bristles so as to thereby prevent the bristles from being bent inwardly toward the hole of the plate, whereby the bristles when pressed against a hard surface cannot bend inwardly to the point of closing off the hole; and,

clamp means for sealingly clamping the flange of the tube to the annular plate and said nozzle, said clamp means including a nut formed with threads conjugate to said nozzle.

4,311,405

SWIVEL CONNECTOR

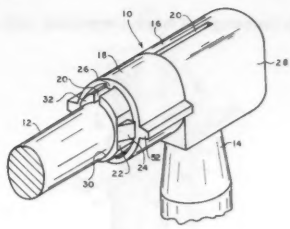
Harry R. Hawley, Lombard, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Oct. 22, 1979, Ser. No. 87,125

Int. Cl.[3] **F16C** *11/00;* **F16D** *1/12*

U.S. Cl. 403—142 **11 Claims**

1. A swivel connector assembly adapted to connect a ball-like member to a rod-like member, the ball-like member having a pivot ball associated therewith, the rod-like member having a head portion defined by a neck portion of reduced diameter, the assembly comprising: an integrally formed coupler, said coupler having a first socket means adapted to confine the pivot ball therein and a second socket means adapted to receive and capture said head portion of the rod-like member, said coupler having a slot means therein passing completely through one of said sockets and partially through the other of said sockets, said slot means permitting enlargement of the said sockets to enable insertion of the head portion and pivot ball into their respective sockets, said coupler having relieved areas on opposite sides thereof proximate the socket which the slot means passes completely through; and a sleeve means, said sleeve means being of a generally cylindrical configuration and dimensioned to be received over and fit closely about the coupler in the area of the completely slotted socket, said sleeve means having at least two inwardly extending tapered projecting means, each projecting means having a portion thereof which is wider than the slot means when said sleeve is received about said coupler, wherein the said sleeve means is adapted to be easily received over the coupler when the projecting means are registered with the relieved areas and rotated to thereby lock the coupler and prevent release of the head portion or the pivot ball.



4,311,406

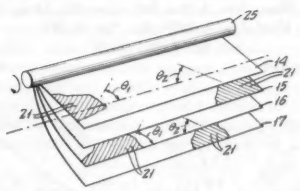
HYBRID PISTON PIN

Howard D. Driver, Raleigh, N.C., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 25, 1979, Ser. No. 51,682

Int. Cl.[3] **F16C** *11/00*

U.S. Cl. 403—161 **6 Claims**



1. A piston pin for a pin-jointed reciprocating mechanism comprising:

a tubular metal sleeve surrounding a fiber-reinforced resin core, at least 50% of said fibers being continuous carbon fibers oriented at an angle ranging from about 0° to about ±25° with respect to the longitudinal axis of the pin, said sleeve and said core being coextensive in length.

4,311,407

BAR OR ROD OR TUBE FRAME MULTI-POSITION ASSEMBLY CLAMP

Patrick Doyle, 163 W. 87th St., New York, N.Y. 10024

Filed Nov. 7, 1980, Ser. No. 204,976

Int. Cl.[3] **F16B** *7/04*

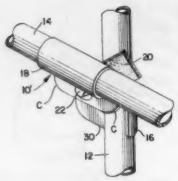
U.S. Cl. 403—390 **1 Claim**

1. A multi-positional clamp for securing rods, bars, or tubes of various lengths in fixed positions and an various angles to produce a frame assembly adapted to be covered with a woven fabric or non-woven sheet, which frame assembly may be subject to motion or vibration, said clamp comprising:

(a) at least two rigid clamping members and

(b) at least one resilient flexible, deformable and cushioning member,

(c) each rigid clamping member comprising
(i) a rotatable flange portion having a flat slidable surface and rounded corners and
(ii) a cradle or embracing portion having a grooved or knurled inner surface opposed to said resilient, flexible deformable cushioning member
(d) each said flat flange portion having a single circular opening formed therein so that each said flat flange portion can be rotated individually about said single fastening bolt
(e) a single fastening bolt means cooperating with said open-



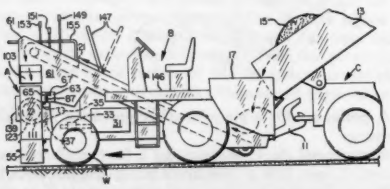
ing formed in each of said slidable flat surfaced flanges of the two rigid members and said resilient flexible, deformable and cushioning member and for holding together said flat slidable surfaces in fact to face contact after rotation into position
whereby in the various positions of the clamp, one or more rounded corners of the flange portion will be presented for contact with the fabric or sheet cover and when the assembly is subjected to motion or vibration, the grooved or knurled inner surfaces of the cradle or embracing portions will overcome the tendency of the rods or bars or tubes to slide.

4,311,408

SIDE DELIVERY ATTACHMENT FOR SPREADER TRUCK

Lawrence D. Wren, Rte. 3, Box 568, Corvallis, Oreg. 97330

Filed Jun. 7, 1979, Ser. No. 46,381
Int. Cl.³ E01C *19/20*
U.S. Cl. 404—104 **6 Claims**



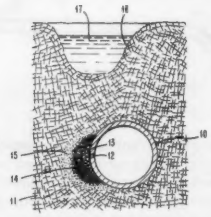
1. An apparatus comprising,
a vehicle having a frame having a front end and a rear end, wheels supporting said frame, said frame having a rear portion projecting beyond the associated wheels and a front portion projecting beyond the associated wheels, receptacle means mounted on said rear portion beyond the associated wheels for receiving crushed rock, conveyor means for conducting crushed rock from said receptacle to the front portion of said frame beyond the associated wheels,
a trough at said front end for receiving crushed rock directly from the conveyor means,
said trough extending from one side to the other of said vehicle and extending beyond said other side to provide an outboard end,
driven means in said trough for conveying said crushed rock laterally,
chute means mounted directly on said outboard end for receiving crushed rock from the last named means and directing it to a predetermined area to one side of said vehicle,
means for detachably mounting said trough on said front end portion of said frame in a position underlying the upper end of said conveyor means,
power means on said vehicle,
and detachable coupling means drivingly connecting said driven means in said trough to said power means.

4,311,409

WET POWDER SEAL FOR GAS CONTAINMENT

Louis G. Stang, Sayville, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 29, 1979, Ser. No. 70,547
Int. Cl.³ E02D *3/14*
U.S. Cl. 405—52 **10 Claims**



1. A method for providing a gas seal over at least part of the surface area of a structure containing a gas, said method comprising the steps of:
(a) providing a compact, contiguous layer of particles over the area to be sealed, said layer being positioned so that any gas escaping through openings in the area to be sealed will flow to said compact layer;
(b) providing means for maintaining said compact layer in place, said means functioning both to prevent disruption of said compact layer due to gas pressure and to prevent passage of the particles of said layer through openings in the area to be sealed; and,
(c) maintaining a liquid in all of the intersticies of at least one contiguous single particle layer within said compact layer, said liquid being chosen so that the particles of said compact layer are wettable by, and insoluble in, said liquid, whereby the passage of gas through the intersticies of said single particle layer is resisted by capillary action on the liquid in the intersticies.

4,311,410

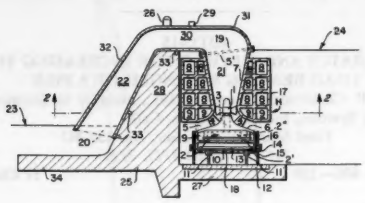
SELF COMMANDED HYDROSTATION

Francisco J. Gutierrez Atencio, Estafeta Dr Garcia, Etre, Argentina

Filed Dec. 10, 1979, Ser. No. 102,822
Int. Cl.³ E02B *9/00*
U.S. Cl. 405—78 **10 Claims**

1. A hydrostation installation including, a main dam fluid retaining body, a siphon-type conduit system for conveying a fluid flow from one side to the other side of said dam body, a controllably movable hydromotive assembly disposed adjacent said dam body, said assembly including a movable ascending conduit branch forming a portion of said conduit system, said ascending branch provided with a lowermost intake open end and uppermost outlet open end, said assembly having an energy generation set provided with at least one component disposed within said ascending branch and adapted to be actuated as a fluid flow is directed therethrough, said conduit system including an additional conduit fixed relative said dam

body and having a descending branch provided with an outlet open end and joined to a bend branch having an intake open



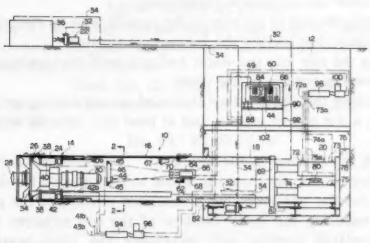
end vertically aligned with said movable ascending branch outlet open end.

4,311,411

PIPE JACKING APPARATUS

Toshio Akesaka, Yano, and Takeshi Hada, Tokyo, both of Japan, assignors to Kabushiki Kaisha Iseki Kaihatsu Koki and Kabushiki Kaisha Aoki Kensetsu, both of, Japan

Filed Apr. 14, 1980, Ser. No. 139,799
Claims priority, application Japan, Apr. 21, 1979, 54-49559
Int. Cl.³ F16L *1/00*
U.S. Cl. 405—184 **4 Claims**



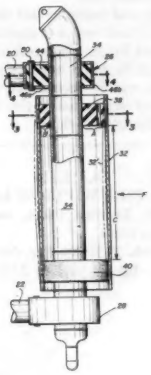
1. A pipe jacking apparatus comprising;
a shield type tunneling machine equipped with plural direction-adjusting jacks;
a tubular body disposed at the rear of said shield type tunneling machine in engagement with said direction-adjusting jacks, and having therein output gages for indicating the outputs of said direction-adjusting jacks, a panel having thereon a center mark maintained in coincidence with the central axis of said tubular body, and a TV camera for taking a picture of the panel;
a thrust jack disposed in a thrust pit for the shield type tunneling machine and exerting a thrust on a pipe member which is to be placed between said thrust jack and said tubular body;
an optical unit disposed within said thrust pit, with the line of collimation thereof direction to a predetermined direction of jacking pipe member, or a light source for irradiating light beam to said predetermined direction of jacking pipe member; and,
an operation panel for operating a TV receiver installed within said thrust pit or on the ground, as well as said direction-adjusting jacks.

4,311,412

OFFSHORE BUMPER SYSTEM AND METHOD OF MANUFACTURING

Edgar A. Guilbeau, Fort Bend, Tex., assignor to Regal International, Inc., Corsicana, Tex.

Filed Jul. 3, 1979, Ser. No. 54,443
Int. Cl.³ B63H *21/04*
U.S. Cl. 405—212 **8 Claims**



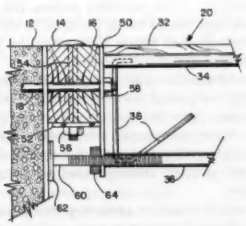
1. In a bumper assembly for connection to an offshore structural member to provide protection to said structural member from contact by vessels such as boats and barges, said assembly having upper and lower support arms for connection to said structural member, a vertically extending unitary nonbuoyant cylindrical contact member of sufficient length to span an area of contact and with an outer surface for engagement by vessels, means supporting said contact member in vertical position, a support member axially extending through said contact member and supported from said arms, a pair of axially spaced resilient means separating said contact member and said support member, means fixing each of said resilient means against rotation with respect to said support arms, the improvement which comprises said axially spaced means positioning said contact member with respect to said support member with the axis of said contact member radially spaced from and extending parallel to the axis of said support member.

4,311,413

CANTILEVERED FINGER PIERS FOR MARINE FLOATS

Wesley W. Sluys, Bellingham, Wash., assignor to Builders Concrete, Inc., Bellingham, Wash.

Filed Oct. 31, 1979, Ser. No. 89,985
Int. Cl.³ E02B *3/20*
U.S. Cl. 405—219 **9 Claims**



1. A marine pier, comprising:
a plurality of rectangular mainwalk floats, each formed by a concrete shell surrounded by a buoyant core, said floats being arranged end-to-end to form a floating, elongated

mainwalk, said mainwalk floats having elongated wales extending along their upper longitudinal edges and a plurality of fastening rods extending transversely therethrough with their ends projecting through respective wales and securing said wales to said floats;

a plurality of finger piers projecting perpendicularly from said mainwalk at space-apart locations, each of said finger piers including an elongated frame and an elongated deck covering said frame; and

a bracket securing said frame to said fastening rods along the outer surfaces of said wales in cantilever fashion with the underside of said finger pier normally spaced above from and unsupported by water beneath said pier such that said finger piers are rigidly secured to said floats despite the presence of said wales using the fastening rods which secure said wales to said floats.

4,311,414

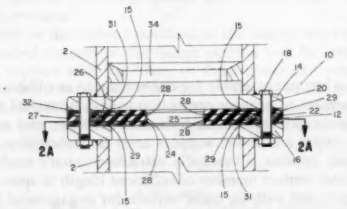
PILE WIPER SEAL

Morris G. Baldridge, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Feb. 29, 1980, Ser. No. 126,061

Int. Cl.³ E02D *5/52*

U.S. Cl. 405—227 **14 Claims**



1. A pile wiper seal assembly sealing the annulus between either a tubular jacket leg or tubular pile sleeve and a pile inserted therethrough of a marine platform, said pile wiper seal assembly comprising:

annular wiper member means having a peripheral portion and a sealing portion extending inwardly therefrom, said annular wiper member means comprising:

elastomeric member means;

annular reinforcing member means having a generally rectangular cross-sectional shape located in the peripheral portion of said annular wiper member means; and

annular reinforcing means located in said annular wiper member means and being secured to the annular reinforcing member means in the peripheral portion of said annular wiper member means, the annular reinforcing means comprising:

first annular reinforcing means extending throughout the peripheral portion and sealing portion of said annular wiper member means, the first annular reinforcing means being secured to the annular reinforcing member means located in the peripheral portion of said annular wiper means; and

second annular reinforcing means extending throughout the peripheral portion of said annular wiper member means into the sealing portion of said annular wiper member means and terminating therein at a diameter substantially equal to the external diameter of said pile inserted through said pile wiper seal assembly; and

annular wiper member retaining means comprising:

a pair of annular plate means, each annular plate means of the pair being secured to the other by a plurality of fastening means extending through the elastomeric member means, the annular reinforcing member means and the annular reinforcing means of said annular wiper member means, said annular wiper member retaining means having at least one of the pair of annular plate means secured to either said tubular jacket leg or said tubular pile sleeve of said marine platform.

4,311,415

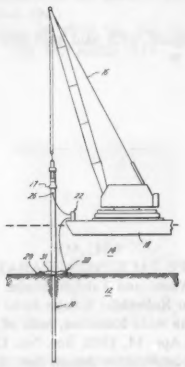
APPARATUS AND METHOD FOR INCREASING THE LOAD BEARING STRENGTH OF A PILE

Lowell B. Christenson, Houston, Tex., assignor to Engineered Piling Systems, Inc., El Segundo, Calif.

Filed Mar. 20, 1980, Ser. No. 132,242

Int. Cl.³ E02D *3/11, 7/26*

U.S. Cl. 405—228 **11 Claims**



1. The method of driving and increasing the load bearing strength of an electrically conductive pile driven into soil having water above the soil comprising,

insulating the top of the pile on the outside with an electrical insulator, but leaving the bottom uninsulated,

driving the pile into the water and soil until the insulator is below the bottom of the water,

connecting the anode of an electrical circuit having an anode, a d-c power source, and at least one cathode to the pile,

placing the cathode in the soil, and

directing dc current from the anode to the cathode for drying out the soil about the uninsulated portion of the pile for reducing the water content of the soil adjacent the uninsulated portion and increasing the load bearing strength of the pile.

4,311,416

PRE-LOAD JACK SYSTEM AND METHOD OF DRIVING ELEMENT INTO THE GROUND

Fredric Rusche, 30303 Beck Rd., Wixom, Mich. 48096

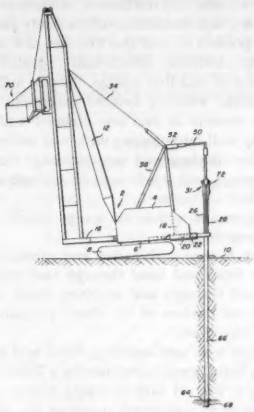
Filed Nov. 7, 1979, Ser. No. 92,442

Int. Cl.³ E02D *7/06, 7/20*

U.S. Cl. 405—232 **8 Claims**

1. The method of forcing an elongate element into the ground with a machine having opposite end portions whose weights in the normal position of repose normally rest upon the ground surface, which method comprises; forcing the element endwise downwardly into the ground by applying down-jacking forces between a member on the first end portion of the machine and the element upon which element the member is drivingly connected, until upwardly reacting forces lift said first end portion upwardly from its normal position of repose and so that at least a portion of the weight of the said one end portion rests upon the element while the other end portion remains at rest on the ground; and then forcing the element further into the ground by first disestablishing the driving connection between the member on the first end portion and

the element and then re-establishing said driving connection before said one end portion reaches its normal position of



repose on the ground so as to drop said portion of the weight of said first end portion onto the element.

4,311,417

MINE ROOF SUPPORT

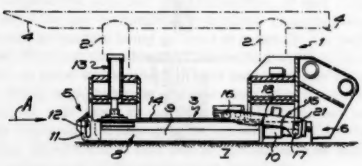
Lewis R. B. Bower; Arthur Scarfe, and John C. Smith, all of Horbury, England, assignors to Fletcher Sutcliffe Wild Limited, Horbury, England

Filed Jan. 25, 1980, Ser. No. 115,385

Claims priority, application United Kingdom, Feb. 3, 1979, 03868/79

Int. Cl.³ E21D *23/04*

U.S. Cl. 405—297 **6 Claims**



1. A self-advancing, hydraulically powered mine roof support comprising a base means, a double-acting hydraulic advancing ram comprising a cylinder and a piston rod extending in the intended direction of advance of the support in use, said cylinder being located towards a forward end of said support and said piston rod being located towards a rearward end of said support, a lifting ram mounted on said support adjacent said forward end thereof and being operable peripherally on said cylinder to lift said forward end of said base means with respect to said cylinder, an end of said cylinder remote from its piston rod being connectable to a pan of an armoured conveyor, and an inclined link means pivotally attached to said base means and pivotally attached to said piston rod and being the sole means by which said advancing ram is connected to said support.

4,311,418

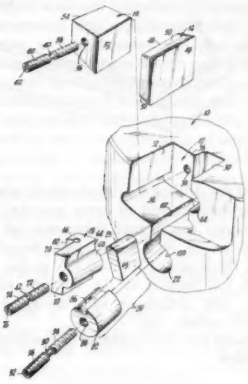
ADJUSTABLE AXIAL AND RADIAL LOCATING WEDGE ASSEMBLIES FOR AN INDEXABLE INSERT CUTTING TOOL

Donald S. Erkfritz, Clarkston, and Lawrence A. Alfonsi, Warren, both of Mich., assignors to General Electric Company, Columbus, Ohio

Filed Jun. 24, 1980, Ser. No. 162,426

Int. Cl.³ B26D *1/12*

U.S. Cl. 407—39 **10 Claims**



1. An adjustable axial locating wedge and indexable insert assembly for an indexable cutting tool, said cutting tool being generally circular and adapted to be rotated about its central axis, said cutting tool having at least one insert pocket disposed at and opening out of the periphery thereof, said pocket having opposed leading and trailing walls, with said pocket further including a rear wall disposed perpendicular to said leading and trailing walls, said adjustable locating wedge means and indexable insert assembly comprising:

an indexable insert having front and rear planar surfaces and a plurality of cutting edge faces disposed therebetween, said insert being received in said insert pocket with one of said planar surfaces being in abutting relationship with one of said pocket walls;

locking wedge means having leading and trailing planar surfaces, with said leading surface being disposed at an angle relative to said trailing surface, said locking wedge means being disposed between the other planar surface of said insert and the other wall of said insert pocket and in abutting relationship therewith, said locking wedge means being radially adjustable such that when the radial position of said locking wedge means is adjusted inwardly, said insert is securely clamped in said insert pocket between said locking wedge means and said one wall of said pocket;

adjustable locating wedge means for adjusting the axial position of said insert, with a portion of said locating wedge means being in abutting relationship with a cutting edge face of said insert, and with said rear wall of said insert pocket further including a locating wedge receiving groove, said groove being aligned with said insert and extending radially inwardly from the periphery of said cutter body and disposed at an angle relative to said rear wall, and with said adjustable locating wedge means being slidably received in said groove; and

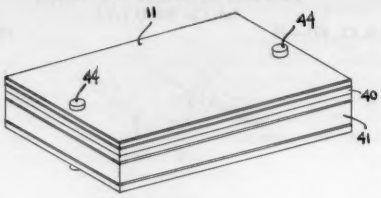
means for adjusting the position of said locating wedge means within said receiving groove, whereby the axial position of said insert may be varied by adjusting the position of said locating wedge means within said receiving groove which thereby varies the axial position of said locating wedge means.

4,311,419

METHOD FOR DRILLING CIRCUIT BOARDS

James P. Block, Long Beach, Calif., assignor to LCOA Laminating Company of America, Garden Grove, Calif.

Filed Jul. 30, 1979, Ser. No. 61,594
Int. Cl.³ B23B *35/00*
U.S. Cl. 408—1 R **5 Claims**



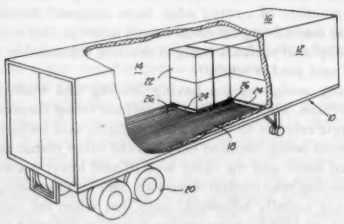
1. A method for drilling a printed circuit board comprising
placing a laminated sheet of entry material on top of said printed circuit board, said entry material being formed from a substrate of a wood pulp-fiberglass composite having a thickness of 0.010–0.125 inches and sheets of aluminum foil bonded to the opposite surfaces of said substrate, said aluminum foil having a thickness of 0.001–0.007 inches, and
drilling through the entry material and printed circuit board in succession.

4,311,420

SNUBBING BLOCK CARGO STABILIZATION SYSTEM FOR REFRIGERATED CARRIERS

Thomas E. Hendricks, Dallas, Tex., and George J. Groenert, Evansville, Ind., assignors to Wilson Foods Corporation, Oklahoma City, Okla.

Filed Nov. 16, 1979, Ser. No. 94,837
Int. Cl.³ B60P *1/64, 7/10;* **B61D** *45/00;* **B63B** *25/24*
U.S. Cl. 410—121 **6 Claims**



1. A cargo stabilizing system for preventing shifting of cargo during transport comprising:
a corrugated channeled cargo supporting floor defining a plurality of elongated, substantially parallel channels, each having a pair of opposed parallel side walls and each having a lower web portion extending between the lower edges of the side walls and forming a channel bottom, and said channels being interconnected by an upper web portion which extends between the upper edges of a side wall of two adjacent channels; and
a snubbing device releasably engaging the floor channels and including:
a snubbing block resting on top of the floor and projecting upwardly therefrom, said snubbing block extending across one of said channels and resting upon a pair of adjacent ones of said upper web portions;
a first wedge element formed integrally with and projecting downwardly from said snubbing block into one said channel underlying said snubbing block, said first wedge element having a surface inclined with respect to the planes of said channel side walls;
a second wedge element positioned movably in said one channel for vertical and horizontal movement therein and having a lower side extending substantially parallel to the lower web portion of said one channel and including an inclined side extending substantially parallel to the inclined surface of said first wedge element and positioned adjacent thereto whereby upward movement of said second wedge element in said one channel will bring said inclined side wall into contact with said inclined surface, and thereafter displace said second wedge element laterally into contact with a side wall of said one channel;
an elongated bolt including:
a head countersunk within the lower side of said second wedge element; and
a bolt shank having a threaded end portion projecting upwardly from said head through said second wedge element and through said snubbing block so that said threaded end portion of the shank projects above the snubbing block; and
a handle element over said snubbing block and including an elongated, axially bored barrel having a lower end engaging the upper side of said snubbing block, and having internal threads in said barrel engaging the threaded end portion of said bolt whereby turning said handle element to rotate said barrel enables said second wedge element to be drawn upwardly in said one channel toward said snubbing block and lowered to a location within said one channel where the lower side of said second wedge element is immediately adjacent the lower web portion of said one channel.

4,311,421

FASTENER

Shigeo Okada, Yokohama, and Katsuo Sato, Yokosuka, both of Japan, assignors to Kato Hatsujou Kabushiki Kaisha and Nissan Jidosha Kabushiki Kaisha, both of Kanagawa, Japan

Filed May 29, 1980, Ser. No. 154,453
Claims priority, application Japan, Jun. 12, 1979, 54-80373[U]
Int. Cl.³ F16B *13/06*
U.S. Cl. 411—59 **4 Claims**

1. A fastener comprising:
an expander part comprising:
a saucer-shaped head; and
a shank extending from said head and formed with a male thread thereon; and
a fastener part comprising:
a flange and opposite stem portions diversing from a position of said fastener part adjacent to a back of said flange and connecting through hing portions to guide portions which join each other at the other ends thereof;
a circular bore extending from the flange to the stem portions to permit said extending part to be inserted therein;
opposite bulges positioned at the bottom of said bore to spread said stem portions outward away from each

other when said expanded part is pushed into said bore and into engagement with said opposite bulges; and

at least one small lug provided on a wall of said bore for engagement with said male thread for temporarily holding said expanded part and said fastener part together until said expanded part is pushed into said bore to spread said stem portions whereby said expanded part and said fastener part are prevented from being separated during handling and transportation.

4,311,422

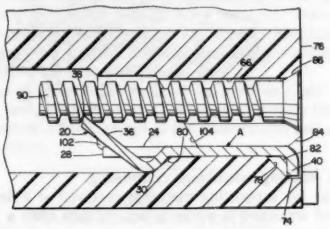
SCREW RETAINER

Frank J. Jackovitz, Ramsey, N.J., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed May 19, 1980, Ser. No. 151,409

Int. Cl.³ F16B *17/00, 37/02*

U.S. Cl. 411—112 **11 Claims**



1. A screw mounting arrangement comprising: a mounting member including a screw receiving hole extending inwardly thereof from an outer surface and having a hole longitudinal axis, a flat slot extending into said mounting member from said outer surface substantially parallel to said hole and in spaced relationship thereto, a connecting slot between said hole and said flat slot, said flat slot having a bottom, an abutment shoulder inwardly of said outer surface and extending from said flat slot bottom on the opposite side of said flat slot from said hole, said abutment shoulder being inclined from said flat slot bottom in directions extending away from said outer surface and away from said screw receiving hole, a substantially flat clip received in said flat slot and having a resilient tang extending therefrom toward said shoulder at a tang abutment projection and then being generally reversely curved to extend toward said longitudinal axis past the intersection of said connecting slot and hole and terminating in a screw engaging edge, said abutment projection being inclined at generally the same angle as said abutment shoulder, said connecting slot having a width at least as great as the width of said tang, said screw engaging edge being engageable by a screw receivable in said hole for deflecting said tang away from said longitudinal axis and firmly engaging said abutment projection with said shoulder to prevent withdrawal of said clip from said flat slot and to prevent withdrawal of the screw from said hole.

4,311,423

HOLE-DRILLING, EXTRUDING AND THREAD-FORMING SHEET SCREW

Fumio Hirabayashi, 11-11, 3-chome, Nishimikuni, Yodogawa-ku, Osaka, Japan

Filed May 21, 1979, Ser. No. 40,538

Claims priority, application Japan, Apr. 25, 1975, 50-57430[U]; Apr. 25, 1975, 50-57431[U]

Int. Cl.³ F16B *25/00*

U.S. Cl. 411—387 **8 Claims**

1. A hole-drilling, extruding and thread-forming sheet screw comprising:

(a) a hole-drilling section which is of an inverted regular pyramid in shape and square in cross section with four sharp corners, and has a piercing point at a bottom end, four substantially vertically extending triangular flat side surfaces and four substantially vertically extending rectilineal cutting edges defined by said four sharp corners, each of said cutting edges serving as a drilling edge for drilling a hole in a workpiece and being spaced apart from each other at an equal angular interval and extending divergently from said piercing point at an equal divergent angle with respect to a central vertical axis of said sheet screw passing said piercing point,

(b) an extruding section which is connected at its lower end to and integral with said hole-drilling section, being of an inverted, truncated regular pyramid in shape and square in cross section with four sides and four round corners which are smoothly continuous to one another, said extruding section having four substantially vertically extending rounded ridges defined by said four round corners and four substantially vertically extending flat side surfaces defined by said four sides, each of said four rounded ridges providing a substantially vertically extending smooth, curved surface gradually and progressively increasing in its radius and arcuate length as said rounded ridges extend upwardly, so that the curved surface can serve as an active surface for smoothly enlarging said hole drilled in the workpiece and forcibly deforming metal around said hole to form a desired tubular extrusion with said workpiece initially with an active force concentrated at a lower end of each rounded ridge with a minimum radius and then with said active force gradually dispersed,

(c) said radius of each rounded ridge being minimized substantially to zero at a bottom end of said extruding section where each rounded ridge is smoothly continuous with

each rectilineal cutting edge of said drilling section in such a manner that a central ridge line of each rounded ridge and an edge line of each cutting edge are disposed on a common rectilineal line,

(d) each of said four substantially vertically extending flat side surfaces of said extruding section being smoothly continuous with each of said four substantially vertically extending triangular flat side surfaces of said drilling section in such a manner that both of said side surfaces are disposed in the same vertical plane so that chips produced by said hole-drilling section can be moved into and received within four spaces or gaps defined by said four substantially vertically extending flat side surfaces of said extruding section and an internal wall of said hole drilled in the workpiece,

(e) said four substantially vertically extending flat side surfaces of said extruding section still existing even though said arcuate length of said rounded ridges is maximinized at a top end of said extruding section, so that said four spaces or gaps remain at said top end of said extruding section,

(f) said extruding section being formed with neither any drilling or cutting edge nor any thread or other projections, and symmetrical with respect to said central vertical axis,

(g) an included angle defined by a pair of said rectilineal cutting edges disposed diagonally oppositely being within the range of from 25° to 45°,

(h) a height or length of said hole-drilling section being within the range of from about one-fourth to one half of a

total height or distance from said piercing point to said top end of said extruding section,

(i) a thread-forming section which is connected at its lower end to and integral with said extruding section and having a cylindrical body and male threads formed therewith, said cylindrical body being equal in external diameter in every point, and said male threads being arranged so as to cut female threads internally with said tubular extrusion, and

(j) a screw and head connected to a top end of said thread-forming section.

4,311,424

PICK-OFF DEVICE FOR AN AUTOMATIC STACKER

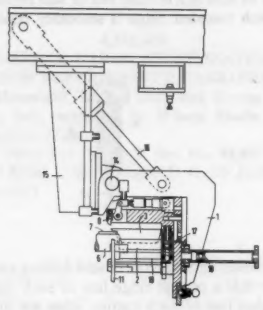
Rolf Schwab, Bischofsheim, and Herbert Stralka, Bad Neustadt, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 29, 1979, Ser. No. 43,214

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1978, 2832210

Int. Cl.³ B65G *61/00*

U.S. Cl. 414—27 **9 Claims**



1. In a pick-off device for an automatic stacker useful in producing stacked laminations for electric machines wherein the number of laminations required for forming a lamination stack are picked off by means of a pick-off head from an orderly supply of laminations stored in a magazine and are passed on to a further processing station by tilting the pick-off head, the improvement, for use in an automatic stacker in which the laminations are pushed onto the pick-off head to form the lamination stack, comprising:

a take-up mandrel on the pick-off head onto which the laminations are pushed;

a horizontal carrier and a guide bar connected to the carrier for carrying the laminations aligned in the magazine, the carrier being aligned with the take-up mandrel;

a pick-off finger on the take-up mandrel which fits into cutouts in the laminations;

means for lifting the pick-off finger vertically relative to the carrier to pick-off at least one lamination;

means responsive to the size of the stack for triggering the means for lifting the pick-off finger when a predetermined number of laminations have been pushed onto the take-up mandrel; and

controlled holding elements for axially retaining the lamination stack on the take-up mandrel when the mandrel is tilted.

4,311,425

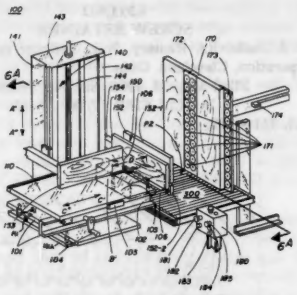
STACKING OF MATERIALS

William F. Pulda, Piscataway, N.J., assignor to Vanguard Machinery Corp., Edison, N.J.

Continuation-in-part of Ser. No. 957,758, Nov. 6, 1978, which is a continuation-in-part of Ser. No. 867,496, Jan. 6, 1978. This application Oct. 1, 1979, Ser. No. 80,214

Int. Cl.³ B65G *57/10*

U.S. Cl. 414—84 **15 Claims**



1. A stacking assemblage comprising

means for supporting materials received at a first position and arranged in a tier in accordance with a prescribed pattern; means for positioning the supporting means at a desired stacking level;

at least one movable guide member in the form of a stripper associated with said supporting means and including, on said movable guide member, switch means for detecting obstacles encountered thereby; means for shifting said supporting means to overlie a second position and depositing said tier thereat as a constituent of a multitier stack.

4,311,426

SYSTEM FOR RECLAIMING BULK SOLIDS FROM A STORAGE PILE

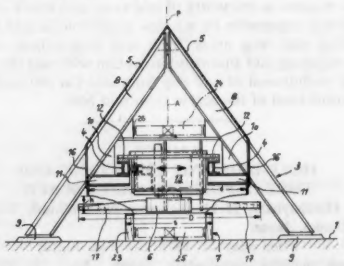
Lothar Teske, Hegelstr. 15, Köln, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 964,922, Nov. 30, 1978, Pat. No. 4,249,845. This application Jun. 1, 1979, Ser. No. 44,657

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1978, 46491

Int. Cl.³ B65G *63/00*

U.S. Cl. 414—133 **17 Claims**



1. A system for reclaiming bulk solids from a large bulk-solids storage pile standing on the ground, said system comprising:

a longitudinally extending row of supports standing underneath said pile on the ground;

at least one beam extending longitudinally along said row and secured to said supports;

a longitudinally extending roof supported on said row of supports and having horizontally and transversely spaced lower edges spaced above the ground;

a longitudinally extending bucket-type conveyor underneath said roof and below said lower edges thereof, said conveyor having

a conveyor element having upper and lower reaches extending longitudinally the full length of said row,

reversing wheels at the upstream and downstream ends of said row over which said conveyor element is spanned,

a plurality of buckets each in turn having a bottom outlet, and

guide rails supporting said buckets;

a carriage displaceable longitudinally along said row beneath said roof and above said conveyor;

an impeller on said carriage rotatable about an upright axis and having arms defining an orbit projecting horizontally outwardly beyond said lower edges into said pile;

means for rotating said impeller about said axis and thereby sweeping bulk solids from said pile onto said conveyor;

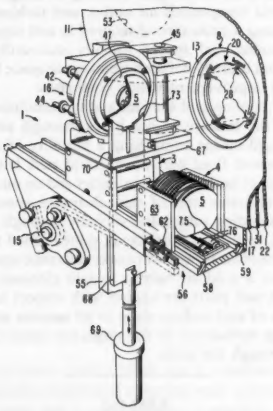
means for driving said conveyor and thereby longitudinally carrying away the bulk solids swept by said impeller arms onto said conveyor; and

a channel recessed in the ground and receiving said lower reach, said channel having a lower wall normally blocking said bottom outlets except at the downstream end of said lower reach.

4,311,427
WAFER TRANSFER SYSTEM

George L. Coad, Lafayette; R. Howard Shaw, Palo Alto, and Martin A. Hutchinson, Santa Clara, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Dec. 21, 1979, Ser. No. 106,342
Int. Cl.³ C23C *15/00*
U.S. Cl. 414—217 **26 Claims**



1. Wafer load lock and feed system for vacuum chamber having an entrance opening in a wall thereof, and a door for sealing said opening, comprising:

a plate-like wafer support within said chamber immediately behind said opening, and provided with an aperture alignable with said opening and of a diameter larger than said wafer;

clip means mounted upon said wafer support about the periphery of said aperture for resiliently gripping edgewise and retaining within said aperture a wafer;

elevator means for raising a wafer to a position adjacent to said chamber entrance opening;

wafer engaging means cooperating with said chamber door for engaging said wafer and bringing said wafer into engagement with said clip means, said wafer being unloaded in similar fashion; and

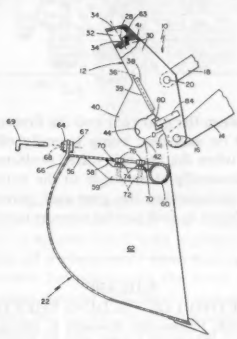
means including a member within said chamber for sealing against the wafer support plate opposite said chamber opening to seal off the region of said chamber entrance from the remainder of said vacuum chamber;

whereby with said door, a load lock of minimal volume relative to said wafer is defined, enabling wafers to be loaded and unloaded into said vacuum chamber continuously with enhanced reliability and speed.

4,311,428
CONNECTORS

Carroll H. Arnold, Westminster, Mass., assignor to Wain-Roy, Inc., Hubbardston, Mass.

Filed May 16, 1979, Ser. No. 39,493
Int. Cl.³ E02F *3/81*
U.S. Cl. 414—723 **30 Claims**



1. In a system comprising a hitch adapted for pivotal connection to a boom for rotation about an axis and including a hook member projecting downwardly from a hitch body and defining a generally upwardly-facing hook engagement surface, and cooperating structure secured to a materials handler and including an opening for receiving said hook member and a cross-member extending transversely across said opening in position for engaging said hook engagement surface, that improvement wherein:

said hitch body includes a pair of spaced parallel, generally vertical side plates;

a hitch bearing plate is secured to and projects generally perpendicularly from one of said side plates defines a generally planar downwardly-facing bearing surface,

a cooperating structure bearing is secured to said cooperating structure and defines a generally planar upwardly-facing bearing surface disposed for engaging said hitch bearing surface, said cooperating structure bearing surface being located intermediate said cross-member and a transverse edge of said opening.

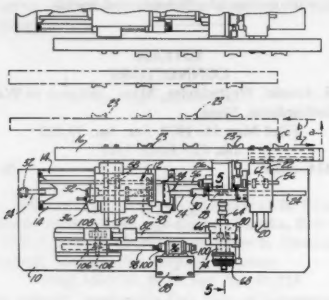
4,311,429
WORKPIECE TRANSFER MECHANISM

Bernard J. Wallis, 25200 Trowbridge Ave., Dearborn, Mich. 48124

Filed Apr. 4, 1980, Ser. No. 137,370
Int. Cl.³ B21D *43/05*
U.S. Cl. 414—750 **8 Claims**

1. In a metal working press having a vertically reciprocable ram, a transfer device including a top plate adapted to be mounted on the press ram, a base adapted to be mounted on the press bed, a mechanism on said base for transferring workpieces between successive stations in the press and drive means for the transfer mechanism comprising a drive gear journalled

on said base for operating the transfer mechanism when rotated in opposite directions and a gear rack mounted on said top plate for movement therewith and meshing with said drive gear, the improvement which comprises a first support on said top plate to which one end of the gear rack is pivotally connected, a pivotal support on said base slidably supporting said gear rack in meshing relation with said drive gear, the pivotal



connection between the gear rack and the first support and the pivotal support on said base being laterally offset from one another so that when the ram is in raised position the gear rack is inclined downwardly at an angle to the vertical whereby, when the ram reciprocates, the gear rack pivots around and shifts axially relative to said pivotal support to rotate the drive gear.

4,311,430

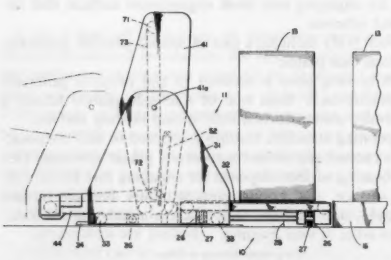
METHOD OF FEEDING SHEETS

Louis J. Frederick, Fairmount; Kenneth E. Hoke, Marion; Jerrold W. Greene, Marion, and Stephen D. Miller, Marion, all of Ind., assignors to Greene Line Mfg. Corp., Marion, Ind.

Division of Ser. No. 943,456, Sep. 18, 1978, Pat. No. 4,265,578, which is a continuation-in-part of Ser. No. 771,456, Feb. 24, 1977, Pat. No. 4,119,220. This application Jan. 24, 1980, Ser. No. 114,985

Int. Cl.³ B65G *57/08, 59/08*

U.S. Cl. 414—786 **2 Claims**



1. A method of feeding sheets comprising the steps of:

aligning a plurality of sheets in a first vertical stack having a vertical stack axis;

supporting said stack with a bottom horizontal surface and a pair of vertical conveyors forming a vertical surface forming together with said horizontal surface forming an included angle of 90°;

tilting said stack with said vertical surface moving toward horizontal;

increasing said included angle during said tilting step allowing said sheets to assume a shingled configuration;

feeding said sheets in a horizontal direction in a shingled configuration on a conveyor;

temporarily accumulating in a second vertical stack the leading sheets being fed during said feeding step;

feeding sheets from the bottom of said second vertical stack in shingled fashion while restraining sheets thereabove in said second stack; and,

moving said plurality of sheets remaining in said first vertical stack away from said second vertical stack when said second stack is full while simultaneously feeding said sheets in said first stack onto said conveyor.

4,311,431

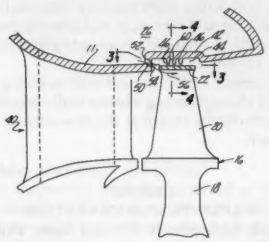
TURBINE ENGINE WITH SHROUD COOLING MEANS

Dennis E. Barbeau, Liberty Center, Ohio, assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Nov. 8, 1978, Ser. No. 958,545

Int. Cl.³ F02C *7/12, 7/28*

U.S. Cl. 415—172 A **5 Claims**



1. In a turbine engine of the type having a support housing, at least one turbine stage rotatably mounted in said housing and having an annular rotation shroud secured around its outer periphery, said turbine engine housing a compressor with a relatively cold compressed air outlet, said turbine engine further comprising a static shroud secured to said support housing coaxially around and spaced radially outwardly from said turbine shroud thereby defining a clearance space between said shrouds, the improvement which comprises:

means for cooling said shrouds and for simultaneously minimizing the leakage of hot gases through said clearance space, said means comprising a plurality of circumferentially spaced fluid ports, each fluid port having an inlet end open to said compressor outlet and an outlet end open to the upstream end of said clearance space, said fluid ports extending substantially axially through said support housing, said fluid ports being dimensioned to provide a compressed air flow toward said clearance space sufficient to create a cold air barrier in said clearance space and wherein said ports are angled with respect to the axis of rotation of said turbine stage in an amount and degree to minimize turbulence in the clearance space from the air flow through the ports.

4,311,432

RADIAL SEAL

Robert J. Kildea, Juno Isles, Fla., assignor to United Technologies Corporation, Hartford, Conn.

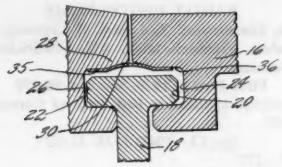
Filed Nov. 20, 1979, Ser. No. 96,101

Int. Cl.³ F01D *25/24*

U.S. Cl. 415—134 **2 Claims**

1. A turbine type power plant having a generally cylindrical outer casing surrounding at least one set of vanes and its adjacent rotor, a segmented generally cylindrically shaped outer air seal between the casing and the tips of the blades on said rotor, platform adjacent the outer edges of said set of vanes and being in substantially axial alignment with but spaced from said outer air seal defining a gap forming a leakage path of engine cooling air into the gas path, a tie connection extending radially inward from said casing securing said platform and said

outer air seal and being disposed adjacent said gap, seal means for said gap disposed between the end of said tie connection and overlying a portion of said platform and said outer air seal and extending across said gap, said seal means being a continuous ring-like element and having a relative low thermal expansion in relation to said case whereby heating of said case deforms said seal means to position it into contact with said platform and outer air seal and seal said gap.

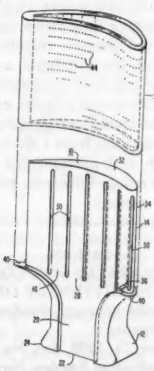


4,311,433

TRANSPIRATION COOLED CERAMIC BLADE FOR A GAS TURBINE

Raymond J. Bratton, Delmont, and Clarence A. Andersson, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 16, 1979, Ser. No. 3,849
Int. Cl.[3] F01D *5/18*
U.S. Cl. 416—97 A **5 Claims**



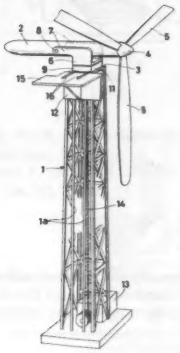
1. A transpiration cooled blade for a combustion turbine engine, said blade comprising a central strut member defining an airfoil portion and a root portion, a plurality of grooves formed in the air foil portion and in flow communication with an air delivery channel in the root portion, a ceramic skin enveloping the air foil portion of the strut and bonded thereto, said skin comprising an innermost layer defining a plurality of apertures therethrough in flow communication with said grooves, an outermost layer defining a plurality of apertures therethrough sufficiently greater in number than said apertures in said innermost layer to provide distributed air flow through the exterior of said blade, layer means positioned between said innermost layer and said outermost layer defining a plurality of flow passages therethrough in flow communication with said apertures of said innermost and said outermost layers permitting cooling air to flow from said grooves to the exterior of said blade.

4,311,434

WIND TURBINE

Minoru Abe, Kashiwa, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Mar. 13, 1981, Ser. No. 243,379
Claims priority, application Japan, Apr. 7, 1980, 55-45438
Int. Cl.[3] F03D *11/04*
U.S. Cl. 416—142 **2 Claims**



1. A wind turbine, comprising in combination a tower, a seat set in position on top of said tower and adapted to mount a nacelle thereon, a nacelle fitted with a propeller type windwheel consisting of a plurality of rotor blades and provided therein with means for converting the wind energy, a base adapted to support thereon said nacelle and attached to said seat for mounting the nacelle, means for supporting said nacelle freely turnable on said base, a mount set in position on the lateral side of said tower, a seat formed on said mount and adapted to mount said nacelle fast thereon, means for moving said mount up and down to permit said mount to be lifted until the upper surface of the seat on the mount becomes flush with that of the seat on the upper end of the tower and enable said mount to be lowered down to the ground level, and means for enabling the base to be shifted on the two seats after the upper surface of the seat of the mount comes flush with that of the seat on the tower.

4,311,435

BALANCED POWER TRANSMISSION DEVICE

Ramon Bergero, 3925 W. 148th St., Hawthorne, Calif. 90250

Filed Oct. 1, 1979, Ser. No. 81,033
Int. Cl.[3] F03D *11/02*; F16H *35/00*
U.S. Cl. 416—170 R **4 Claims**

1. A balanced power transfer device comprising:

a first shaft having a first pinion gear fixedly attached to one end of said shaft,

a first pair of gears each in a driving relationship with said first pinion gear and aligned on a second shaft that is orthogonal with respect to said first shaft,

a cylindrical elongated sleeve coaxial with a portion of said second shaft and freely rotatable about said second shaft,

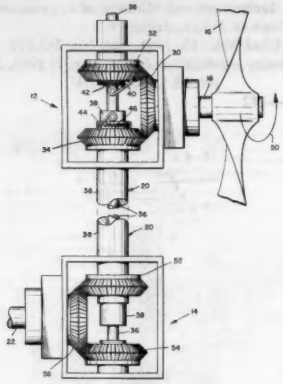
said pair of gears including a first gear mounted on and freely rotatable about said second shaft, and a second gear mounted on and freely rotatable about said sleeve,

a first ratchet assembly interconnecting said second shaft with said first gear in a driving relationship for shaft rotation in a given direction,

a second ratchet assembly interconnecting said sleeve with said second gear in a driving relationship for shaft rotation in an opposite direction,

a second pair of gears each fixedly attached to said second shaft and said sleeve respectively, and

a second pinion gear fixedly attached on a third shaft that is orthogonal with respect to said second shaft and in a



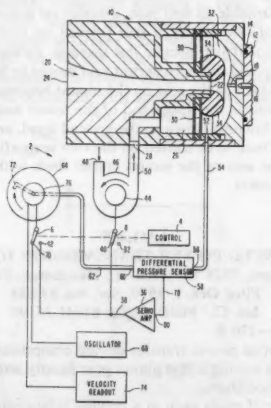
driving relationship with each of said second pair of gears whereby the counter rotation of the sleeve and the second shaft substantially removes any residual torque.

4,311,436

FLUID PRESSURE AND VELOCITY SENSING APPARATUS

Ferdinand Hendriks, Yorktown Height, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 13, 1979, Ser. No. 94,401
Int. Cl.³ F04B *41/06*
U.S. Cl. 417—2 **11 Claims**



4. In an air servo system for an ink jet aspirator, the combination comprising:

an air tunnel in said aspirator, having an input and an output;

an electrically controlled air source responsive to an electrical error signal for providing air to the input of the air tunnel of said aspirator at a controlled velocity determined by said electrical error signal, for providing airflow to the output thereof;

a reference air source for providing a reference airflow;

an airflow sensing means for sensing the pressure differential between the airflow from said reference air source and the airflow through said air tunnel in said aspirator, for producing a pressure differential; and

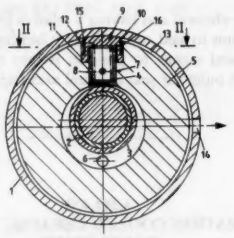
transducer means responsive to the produced pressure differential in said airflow sensing means, and for converting same to said electrical error signal for provision to said electrically controlled air source to control same for providing air therefrom to the air tunnel in said aspirator.

4,311,437

RADIAL PISTON PUMP

Georg Liska, Zimmerbach, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG, Friedrichshafen, Fed. Rep. of Germany

Filed Dec. 3, 1979, Ser. No. 99,478
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1978, 2852852
Int. Cl.³ F04B *1/18, 21/02*
U.S. Cl. 417—273 **6 Claims**



1. In a piston pump having a housing **(1)** enclosing a carrier **(5)** within which at least one piston **(4)** is mounted for displacement of fluid from a piston chamber to a pressure chamber **(13)** the improvement comprising a valve seat member **(9)** fixed to the housing in overlying slide bearing relation to the piston having a peripheral wall **(16)** within which a pressure passage **(12)** is formed establishing fluid communication between the piston chamber and the pressure chamber, and elastic valve means **(15)** mounted on the peripheral wall of the valve seat member for controlling flow of fluid through said passage in response to elastic deformation relative to the peripheral wall under pressure of the fluid, said peripheral wall having an outer perimeter that deviates from a circle to reduce diameter portions spaced from said passage, said valve means being deformed toward the reduced diameter portions of the peripheral wall to open the passage.

4,311,438

METHOD AND APPARATUS FOR CONTROLLING THE START OF AN INTERMITTENTLY OPERATING PUMP

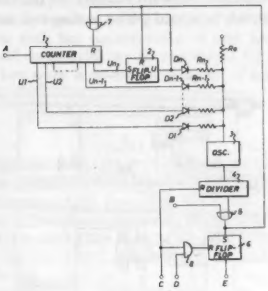
Anders Comstedt, Löddeköpinge, Sweden, assignor to El-Fi Innovationer AB, Sweden

Filed Nov. 21, 1979, Ser. No. 96,600
Claims priority, application Sweden, Nov. 20, 1978, 7811933
Int. Cl.³ F04B *49/00*
U.S. Cl. 417—12 **7 Claims**

1. A method of controlling the start of an intermittently operating pump, characterized by measuring the running time of the pump drive motor from the last start thereof and controlling the duration of the pause time commencing at the end of the running time in dependence on the measured duration of the preceding running time such that the pause time increases for decreasing running times at least between a first predetermined running time and a second predetermined running time, shorter than said first running time.

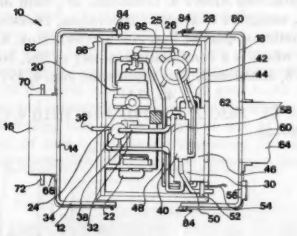
4. An apparatus for controlling the start of an intermittently operating pump, characterized by a running time gauge **(1, 2)** for measuring the running time of a pump drive motor from the last start thereof and start delay means **(3, 4)** coupled to said running time gauge and said pump drive motor for starting said pump drive motor with delay after the end of the running time, the duration of said delay being dependent on the duration,

measured by said running time gauge, of the preceding running time such that the pause time increases for decreasing running



times at least between a first predetermined running time and a second predetermined running time, shorter than said first running time.

4,311,439
COMPRESSED AIR SYSTEM
Kenneth A. Stofen, 3642 Country La., Racine, Wis. 53405
Filed Oct. 17, 1979, Ser. No. 85,760
Int. Cl.[3] F04B *39/16*
U.S. Cl. 417—313 **10 Claims**



1. In an air compressor system of the type having fluid-treating components including a compressor, conduit means for transmitting hot compressed fluids from the compressor, and means for cooling such hot fluids, the improvement comprising:

a substantially airtight cabinet enclosing the fluid-treating components and having ambient air inlet means, a compressed air outlet, and a cooling air outlet;

means sealed over the inlet means to clean incoming ambient air whereby substantially all air within the cabinet has been cleaned thereby;

said compressor having an air intake within the cabinet whereby air drawn into said compressor is cleaned air received from within the cabinet;

said cooling means including heat exchange surfaces connected to said conduit means; and a fan positioned and arranged to move cleaned air from within the cabinet over said heat exchange surfaces as a cooling fluid.

7. In an air compressor system of the type having fluid-treating components including a compressor, conduit means for transmitting hot compressed fluids from the compressor, and means for cooling such hot fluids, the improvement comprising:

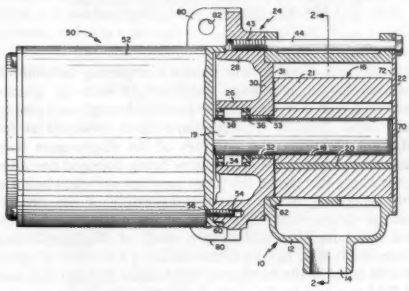
a substantially airtight cabinet enclosing the fluid-treating components and having an ambient air inlet, a compressed air outlet, and a cooling air outlet, said cabinet including a substantially vertical surrounding wall section for standing on a floor and a removable cover engaged with the wall section;

means connected to the cover for raising the cover from the wall section for service of the fluid-treating components;

means sealed over the inlet to clean incoming ambient air;

said cooling means including heat exchange surfaces connected to said conduit means; and a fan positioned and arranged to move air from within the cabinet over said heat exchange surfaces.

4,311,440
PUMP
H. Alfred Eberhardt, Paoli, Pa., assignor to Hale Fire Pump Company, Conshohocken, Pa.
Filed Jan. 5, 1977, Ser. No. 757,049
Int. Cl.[3] F04B *39/14*
U.S. Cl. 417—360 **3 Claims**



1. A vacuum pump adapted to be used as a priming pump comprising:

a pump assembly including a pump housing having a suction and a discharge opening, and a rotor rotatably mounted within said pump housing for pumping fluid between said suction and discharge openings, said rotor having a central bore for receiving a drive shaft,

a motor assembly including a motor housing, and a motor shaft extending from said housing a substantial extent,

a mounting head,

means securing said pump assembly to one side of said mounting head,

said mounting head enclosing said one end of said pump assembly and having a shaft bore,

means securing said motor assembly to the other side of said mounting head with said motor shaft extending through said shaft bore of said mounting head and into said rotor central bore for driving said rotor,

a pump head enclosing the other end of said pump assembly opposite said one end enclosed by said mounting head, said rotor being mounted on said motor shaft for slidable movement axially thereon and being arranged to extend between opposed faces of said mounting head and said pump head with a predetermined clearance, said pump head having a portion projecting inwardly toward said rotor from said opposed face of said pump head for contacting the rotor in a limited region near its center, and a sleeve bearing mounted in said shaft bore for rotatably supporting said motor shaft within said mounting head, said sleeve bearing extending inwardly toward said rotor beyond said opposed face of said mounting head for contacting the rotor in an annular region around the motor shaft.

4,311,441

POSITIVE DISPLACEMENT DEVICE

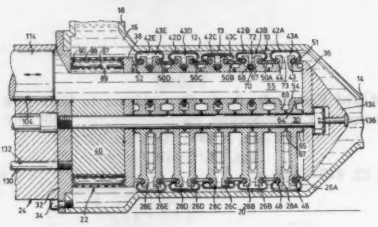
Frederick Scragg; Michael L. Scragg, both of Trinity, Jersey, and Peter Marshman, St. Brelade, Jersey, all of Channel Islands, assignors to Mantec Industries Limited, Channel Islands

Filed Dec. 28, 1979, Ser. No. 107,786

Claims priority, application United Kingdom, Jan. 9, 1979, 00810/79

Int. Cl.³ F04B *43/00*

U.S. Cl. 417—383 **9 Claims**



1. A fluid displacement device comprising an outer body member having a passage therethrough with an opening at each end, and an inner member passing through said passage, at least three flexible toroidal diaphragms mounted at axially adjacent locations, the interiors of the diaphragms forming discrete chambers, the diaphragms being disposed one after the other along the axis of the inner member and each being movable separately of the others transversely of the axis of the passage to close off the passage of the respective diaphragm, said inner member including a stack of diaphragm support plates, each plate having means defining a number of apertures therein equal to the number of diaphragms to form that number of fluid passages to the stack, the diaphragms being mounted to extend around the periphery of adjacent support plates, means defining ducts between the chamber formed in each diaphragm and a separate one of said fluid passages, and means to feed through said fluid passages an operating fluid under pressure to, or to receive operating fluid under pressure from said discrete chambers to move said diaphragm transversely of the axis of the body in a sequence to cause displacement of an external fluid axially of the body, or to enable power to be derived from the operating fluid as a result of an external fluid moving axially of the body in contact with said diaphragms.

4,311,442

ROTARY PISTON MACHINE WITH ALTERNATING PISTONS AND SEALINGS THEREFOR

Istvan Simon, Otterngutstrasse 37, Schaffhausen CH-8200, Switzerland

PCT No. PCT/CH78/00012, § 371 Date May 23, 1979, § 102(e) Date May 21, 1979, PCT Pub. No. WO79/00157, PCT Pub. Date Apr. 5, 1979

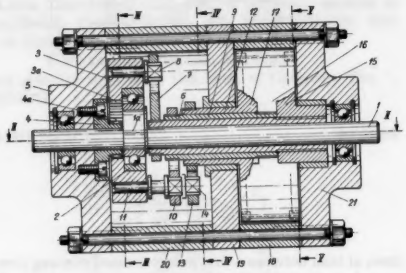
PCT Filed Aug. 9, 1978, Ser. No. 40,916

Claims priority, application Switzerland, Sep. 23, 1977, 011621/77

Int. Cl.³ F01C *1/07, 19/00*

U.S. Cl. 418—37 **18 Claims**

1. In a rotary piston machine with a cylindrical housing and a drive shaft lying in the cylinder axis, the housing enclcsing a hollow rotation space in which at least two sector-shaped rotary pistons with angular velocities changing periodically relative to each other are arranged one after the other in such a way that working spaces develop between the rotary pistons whose volumes change periodically, an improvement wherein the drive shaft carries an eccentric cam on which is posed a driving plate provided with internal toothing which engages a spur wheel coaxial with the drive shaft, said spur wheel being firmly fixed to the housing, the driving plate carrying driving pins each in operative connection with a piston rod and each piston rod having a torsion-resistant connection to one of the rotary pistons via a hollow shaft lying coaxially to the drive shaft, the rotary pistons being provided with sealings, each of the sealings effective outward radially on the outer casing of the rotary piston is equipped with a sealing rod, two sections of



said sealing rod being offset on the longitudinal sides facing each other in such a way that they have a common displacement plane, and that the two rod sections are subjected to the pressure of a helical spring acting in the axial direction and a bent leaf spring acting radially.

4,311,443

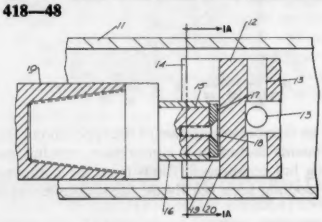
MOTOR/PUMP TRANSMISSION CONSTRUCTION FOR A MOINEAU TYPE APPARATUS

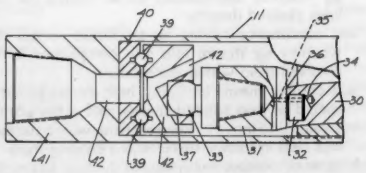
Wallace Clark, and Albert S. Goldstein, Jr., both of Indianapolis, Ind., assignors to Oncor Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 958,647, Nov. 8, 1978, abandoned, which is a continuation-in-part of Ser. No. 878,814, Feb. 17, 1978, abandoned. This application Jun. 4, 1979, Ser. No. 45,242

Int. Cl.³ F03C *2/22;* F16D *3/04;* E21B *4/02*

U.S. Cl. 418—48 **3 Claims**





1. A transmission construction for transmitting power between the rotating and eccentrically gyrating inner member of a Moineau type motor, and a shaft running on true centers and driven thereby, comprising an extension on one end of said inner member disposed on its lathe axis, and a recess associated with said driven shaft, said extension entering said recess,

whereby transmission of torque between said inner member and said shaft is achieved solely by the eccentric gyration of said inner member acting against said recess, a ball-and-box support for the opposite end of said inner member, said support comprising a head threadedly mounted on the said opposite end of said inner member on the center of the cross-section of said opposite end, but eccentrically of said head, said head carrying a ball on its axial center, and means for orienting said ball so that its center is on the lathe center of said inner member.

4,311,444

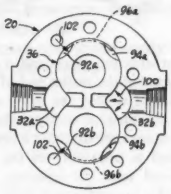
PRESSURE-BALANCING END PLATE FOR A REVERSIBLE GEAR PUMP OR MOTOR

Donald L. Shumate, 1296 Frost Rd., Streetsboro, Ohio 44240

Continuation of Ser. No. 31,545, Apr. 19, 1979, abandoned. This application Dec. 3, 1979, Ser. No. 99,413

Int. Cl.³ F03C *2/08;* F04C *2/18, 15/00*

U.S. Cl. 418—74 **9 Claims**



1. In a pressure-balancing end plate structure for a reversible gear pump or motor, the plate structure having two circular portions each with a hole therethrough defining a figure-eight configuration including throat areas, said circular portions each having a gear tooth confronting face region, the improvement comprising a fluid pressure-transmitting path in each of said circular portions spaced from said gear tooth confronting face region and terminating in locations opening into said gear tooth conforming face region on either side of a line through the centers of said holes, said terminating locations of said paths being circumferentially spaced from said throat areas.

4,311,445

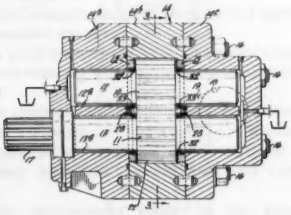
CONTAMINANT RESISTANT GEAR PUMPS AND MOTORS WITH WEAR INSERTS

James M. Eley, and Arthur B. Joyce, both of Corinth, Miss., assignors to Tyrone Hydraulics, Inc., Corinth, Miss.

Filed Oct. 30, 1979, Ser. No. 89,302

Int. Cl.³ F03C *2/08;* F04C *2/18, 15/00*

U.S. Cl. 418—132 **3 Claims**



1. In hydraulic equipment of the gear type having intermeshing gears, a housing for the gears, gear support shafts within said housing and journal bearings supporting said shafts for rotation within said housing, bearing drain passages in said housing for maintaining said journal bearings at a relatively low pressure, a pair of floating pressure plates on opposite sides of said gears, said plates being mounted for movement axially of the shafts towards the sides of said gears, said plates having a flat surface of bronze or like bearing material on the plate side which faces said gears to form a bearing surface therewith, means for communicating the high pressure operating fluid to the sides of the plates which face away from the gears to urge the plates into sealing relationship with the sides of the gears, each plate having a pair of openings sized to provide clearance for the gear shafts, an insert of abrasion and erosion resistant material recessed within each opening, said inserts being secured against movement with respect to the plates and extending axially of the shafts from the plate sides facing the gears to the ends of the journal bearings and further extending radially from points adjacent the circumference of the gear shafts to the root circle of the gear teeth.

4,311,446

INJECTION MOLDING MACHINE CONTROLS

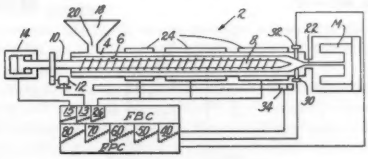
Peter Hold; Angelo J. Notte, both of Milford, and Marc A. Rizzi, Orange, all of Conn., assignors to USM Corporation, Farmington, Conn.

Division of Ser. No. 435,347, Jan. 21, 1974, Pat. No. 3,870,445, which is a continuation of Ser. No. 326,887, Jan. 26, 1973, abandoned, which is a division of Ser. No. 194,280, Nov. 1, 1971, abandoned. This application Apr. 3, 1974, Ser. No. 457,327

The portion of the term of this patent subsequent to Mar. 11, 1992, has been disclaimed.

Int. Cl.³ B29F *1/06*

U.S. Cl. 425—144 **4 Claims**



1. A control for the temperature of plastic melt within an injection molding machine having a barrel, heating means for heating said barrel, a screw within said barrel, motor means for rotating the screw and means for applying pressure to said screw in a direction along its longitudinal axis whereby said screw acts as a piston comprising:

a. a first control means connected to said heating means for controlling the amount of heat supplied to said barrel by said heating means;

b. a second control means connected to said motor means for varying the rotational speed of said screw;

c. a third control means connected to said means for applying pressure to said screw for varying the amount of pressure applied to said screw; and

d. means interconnecting said first, second and third control means for rendering said control means selectively operable whereby the temperature of the plastic melt is maintained within predetermined limits.

4,311,447

RADIANT SURFACE COMBUSTOR

Ray A. Rackley, Phoenix, Ariz., and David V. Carpenter, Mendocino, Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

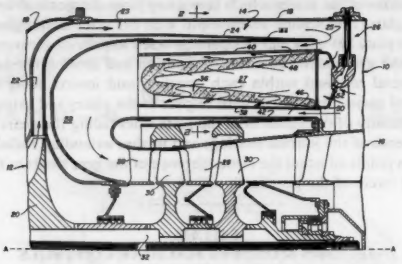
Division of Ser. No. 916,161, Jun. 16, 1978, Pat. No. 4,280,329. This application Dec. 21, 1979, Ser. No. 106,296

Int. Cl.³ F23D *13/12*

U.S. Cl. 431—7 **23 Claims**

1. A radiant surface combustor for supplying heat energy to the working fluid of a heat engine, comprising a porous combustor element including a pair of spaced porous plates; means for supplying fuel and air to adjacent sides of said plates for

passage therethrough and combustion at the opposite sides thereof to produce primarily radiant heat energy; and an extended heat transfer surface in close proximity with said other



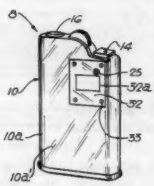
side of said combustor element for absorbing the generated heat energy, said heat transfer surface being in heat exchange relation with the working fluid for transferring the absorbed heat energy to the working fluid.

4,311,448

SMOKING ELIMINATION GUIDANCE SYSTEM

Edward Strauss, 2828 N. Pine Grove, Chicago, Ill. 60657

Filed Mar. 31, 1980, Ser. No. 135,228
Int. Cl.³ F23N *5/26*
U.S. Cl. 431—14 **14 Claims**



1. A smoking elimination system comprising: smoker-use signal generating means for generating a smoker-use signal each time the use of a cigarette or the like is to be initiated by the user; timing means responsive to the generation of each smoker-use signal for initiating a new predetermined timing period during which only a single use of a cigarette or the like is to be permitted; indicator means for indicating to the user the end of the current timing period established by the timing means; and timing period modifying means for automatically at various times progressively increasing the timing periods initiated by the generation of said smoker-use signals so that the timing intervals between successive uses of a cigarette or the like progressively increase to a point where the smoker can readily stop smoking.

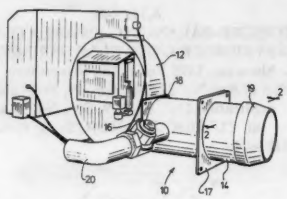
4,311,449

FORCED DRAUGHT FUEL BURNER

Walter H. Young, Scarborough, Canada, assignor to Pendell Boiler Limited, Toronto, Canada

Filed Feb. 13, 1980, Ser. No. 121,191
Int. Cl.³ F23Q *9/00*
U.S. Cl. 431—284 **14 Claims**

1. An improved fuel burner comprising, in combination; a cylindrical blast tube adapted to be connected to a source of forced-draught combustion air and a source of fluid fuel; a first inner cylindrical tube substantially concentric with and spaced from said blast tube defining an outer annular space therebetween, said pair of substantially concentric tubes having inlet ends and outlet ends; baffle means positioned within the outer annular space at the outlet ends of the pair of tubes, said baffle means having a substantially peripheral circular opening of uniform cross-section for discharge of secondary combustion air; a second inner cylindrical tube having means for mounting said second inner tube substantially concentrically within said first inner tube for axial reciprocal travel therein, said second inner cylindrical tube having an inlet end and an outlet end and said second inner tube defining an inner annular space with said first inner tube; a diffuser ring having an outside diameter smaller than the diameter of the first inner cylindrical tube defining a narrow circular slot of uniform cross-section at the



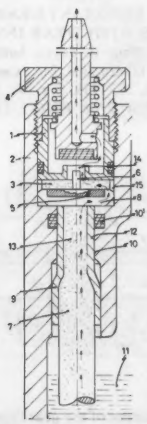
periphery of the inner annular space and a plurality of equi-spaced openings mounted at the outlet end of said second inner tube adapted to be seated within the inner annular space for discharge of primary combustion air from the said inner annular space, said second inner tube defining a central conduit; and closure means mounted in proximity to the inlet end of said second inner cylindrical tube for opening and closing said central conduit whereby an additional flow of primary combustion air through said central conduit can be adjusted; and means for discharging a fluid fuel into a flow of said combustion air.

4,311,450

DEVICE FOR LIMITING THE GAS FLOW IN A DISCHARGE VALVE FOR GAS LIGHTERS AND METHOD

Arturo Camos, Magenta, Italy, assignor to SAFFA S.p.A, Milan, Italy

Filed Oct. 1, 1979, Ser. No. 80,345
Claims priority, application Italy, Apr. 13, 1979, 21855 A/79
Int. Cl.³ F23D *13/04*
U.S. Cl. 431—344 **1 Claim**



1. A method of making a device for permanently limiting the gas flow in a discharge valve for lighters for cigarettes, said device comprising

a housing;

a tank mounted in said housing and filled with liquified gas;

a porous longitudinal element having one end dipped into said tank to transfer said gas by capillary action to said discharge valve;

a jacket encompassing said porous element to form a combined unit mounted in said housing;

said method comprising the steps of:

introducing said combined unit prior to mounting it in said housing in an apparatus capable of measuring the flow of said gas through said unit;

interlocking said apparatus with a die adapted to neck down said combined unit so that the length of said unit which is necked down corresponds to the flow of said gas measured by said apparatus;

subjecting said combined unit to a necking down action by moving said die along said unit starting from an end thereof while gas is flowing through said unit;

stopping said necking down action when said gas flow reaches a value read at said apparatus providing a desired flame height and thereupon permanently setting said necked down portion; and

subsequently mounting said premanently set necked down combined unit in said housing.

4,311,451

BURNER

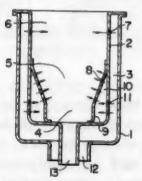
Michiaki Matumoto, Tokyo, and Sadao Mimori, Yoshikawamachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 13, 1978, Ser. No. 942,030

Claims priority, application Japan, Sep. 13, 1977, 52-110260; Sep. 13, 1977, 52-110261

Int. Cl.³ F23D *13/40;* F23N *1/00*

U.S. Cl. 431—352 **13 Claims**



1. A burner comprising:

a combustion chamber;

air ports communicating with an air inlet and opening into said combustion chamber;

auxiliary air ports opening into said combustion chamber via an air speed reducing section communicating with said air inlet; and

a fuel outlet communicating with supply means for supplying one of a gaseous fuel and a premix of a gaseous fuel and primary air in which the fuel is enriched above a flammability limit and opening into said combustion chamber;

wherein the improvement resides in the arrangement whereby:

said auxiliary air ports are located downstream of said fuel outlet with respect to the direction of flow of the fuel in said combustion chamber and said air ports are located further downstream of said auxiliary air ports, so that air is supplied through said auxiliary air ports at a relatively low flow velocity due to speed reduction in said speed reducing section and air is supplied through said air ports at a relatively high flow velocity.

4,311,452

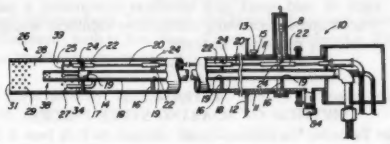
HIGH STABILITY GAS/ELECTRIC PILOT-IGNITOR

Pierre Begin, Boisbriand, Canada, assignor to CEA of Canada, Ltd., Montreal, Canada

Filed Feb. 4, 1980, Ser. No. 118,561

Int. Cl.³ F23D *15/02*

U.S. Cl. 431—352 **19 Claims**



1. A pilot for gas burning ignitors comprising:

(a) sources of pressurized gas and primary and secondary air;

(b) an elongated chamber having aspiration ports in the wall of the same in fluid communication with the source of primary air for mixing said air with gas;

(c) a gas jet means mounted on one end of the chamber in fluid communication therewith and with the source of pressurized gas;

(d) a gas/air mixture flow accelerating and decelerating means mounted on and in fluid communication with the other end of said mixing chamber having a lip means exposed therebetween to the flow of mixture therethrough and in heat conduction relation with a heat sink mounted thereby;

(e) an electric discharge means mounted adjacent to the lip means for igniting the combustible mixture of primary air and gas; and

(f) an elongated shroud mounted on and in fluid communication at one end with the other end of said mixing chamber and having aspiration ports in the wall of the same in fluid communication with the source of secondary air for controlling the secondary combustion therein.

4,311,453

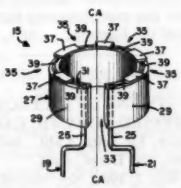
HIGH VOLTAGE FLASHLAMP WITH IGNITION MEANS INCLUDING A PLURALITY OF SPARK GAP MEMBERS

Timothy Fohl, Carlisle, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed May 5, 1980, Ser. No. 146,575

Int. Cl.³ F21K *5/02*

U.S. Cl. 431—362 **15 Claims**



1. In an electrically-activated flashlamp including a light-transmitting envelope, a quantity of light-emitting combustible material within said envelope, and ignition means for igniting said light-emitting combustible material, the improvement wherein said ignition means comprises:

a pair of lead-in wires secured within said envelope, each of said lead-in wires having an end portion extending within said envelope;

an insulator member positioned on at least one of said extending ends of said lead-in wires and oriented within said

envelope relative to said light-emitting combustible material; and

a plurality of spark gap members located on said insulator in a predetermined pattern, said spark gap members arranged in an electrical series relationship and electrically coupled to said extending end portions of said lead-in wires for igniting in a substantially simultaneous manner upon application of a high voltage pulse across said lead-in wires, each of said spark gap members comprising a pair of spaced-apart electrically conductive members bridged by a quantity of primer material.

4,311,454

METHOD OF SOAKING STEEL PIECES

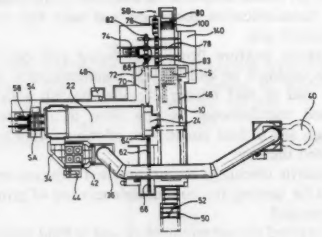
Seigo Tabuchi, Narashino, Japan, assignor to Itoh Iron & Steel Works Co. Ltd., Tokyo, Japan

Division of Ser. No. 963,829, Nov. 27, 1978, Pat. No. 4,214,868. This application Jan. 28, 1980, Ser. No. 116,315

Claims priority, application Japan, Jun. 21, 1978, 53-75220

Int. Cl.³ F27D *3/00*

U.S. Cl. 432—11 **7 Claims**



1. In the method of heat soaking elongated cold steel ingots by passing said ingots sequentially through a preheating chamber and a soaking furnace, said soaking furnace extending perpendicularly to said preheating chamber and communicating therewith and from which a portion of the heat is transferred to the preheating chamber, the improvement comprising the steps of feeding the ingots to said preheating chamber with their longitudinal axis parallel to and moving in a direction normal to the axis of said furnace, and thereafter during movement through said preheating chamber and without change in the position of the longitudinal axis of the ingot relative to the axis of the furnace effecting a first translatory motion changing the direction of movement of said ingot to move parallel to the axis of said furnace, a second translatory motion to change the direction of movement of said ingot to move normally to the axis of the furnace, and a final translatory motion to move the ingot into said furnace in a direction parallel to the axis of the furnace.

4,311,455

THERMAL ADJUSTMENT OF DIELECTRIC CONSTANT OF HOT-PRESSED CERAMIC CAPACITORS

Joseph W. Crownover, La Jolla, Calif., assignor to Statnetics Laboratories Corp., San Diego, Calif.

Filed Sep. 2, 1980, Ser. No. 183,303

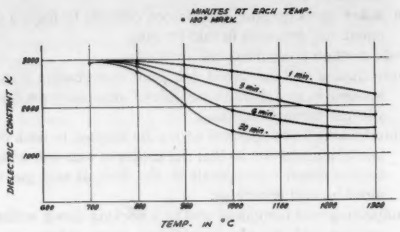
Int. Cl.³ F26B *9/12*; F27B *14/00*

U.S. Cl. 432—18 **12 Claims**

1. The method of achieving close control of the electrical capacitance of a hot pressed, finished ceramic capacitor body the dielectric constant of which has previously been substantially increased by subjecting the capacitor body to sintering temperature and simultaneous relatively high pressurization, that includes,

(a) subjecting the finished capacitor body to elevated temperature

(b) and reducing the dielectric constant of the body to preselected level by maintaining said body at said elevated temperature while simultaneously maintaining the body at



relatively low pressurization, for a time interval until the dielectric constant drops to said level.

4,311,456

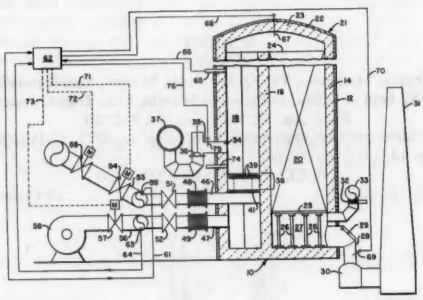
BLAST FURNACE STOVE

Stanley J. Kletch, Bridgeville, Pa., assignor to Bricmont & Associates, Inc., McMurray, Pa.

Filed Jul. 18, 1980, Ser. No. 170,288

Int. Cl.³ F24H *7/00*; C21B *9/00*; F23D *3/40, 19/00*

U.S. Cl. 432—30 **19 Claims**



1. A vertically-fired blast furnace stove comprising a vertically-extending combustion chamber having a discharge opening for heated air, heat-storage means to receive the products of combustion from said vertically-extending combustion chamber, air-supply means communicating with said heat-storage means for discharging heated air therefrom to said discharge opening, a mixing bed comprised of a multitude of bodies upon a carrier in the bottom portion of said combustion chamber to mix and heat fuel and air supplies for combustion thereabove before passage of combustion products into said heat-storage means, said bodies being comprised of heat-resistant, high-temperature material, said carrier including a grid with openings capable of passing fuel and air into the bed to undergo heating within the bed while passing along the space between the bodies of the bed, and means including control valves to introduce fuel and air directly without combustion into said mixing bed for rapid combustion thereabove in said combustion chamber.

4,311,457

BASING HEATING APPARATUS

Masatoshi Hayakawa, Nagoya, and Koei Ogi, Komaki, Japan, assignors to CKD Corporation, Komaki, Japan

Filed Jun. 2, 1980, Ser. No. 155,086

Claims priority, application Japan, Jun. 8, 1979, 54-78134[U]

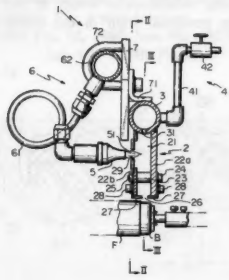
Int. Cl.³ F24H *1/00*; F24J *3/00*

U.S. Cl. 432—222 **4 Claims**

1. A basing heating apparatus for heating partially a base of

a fluorescent tube held at opposite ends thereof and moving along a predetermined path while revolving on its axis, comprising:

a hot blast injection head provided along the direction of movement of said fluorescent tube and having an elongated slit for injecting a fluid from within a mixing chamber toward only the base of said tube;



an air supply pipe for injecting an adjustably pressurized air from the direction linearly aligned to the direction of injection by the slit toward the inside of said mixing chamber of said hot blast injection head; and

a burner device for injecting a flame from the direction intersecting substantially at right angles said pressurized are introduced into said mixing chamber to heat said pressurized air within said mixing chamber to high temperatures.

4,311,458

TUNNEL FURNACE FOR FABRICATING PLATE-LIKE FLAT STRUCTURES, ESPECIALLY PRINTED CIRCUIT BOARDS COATED AT BOTH SIDES WITH A CURABLE MATERIAL

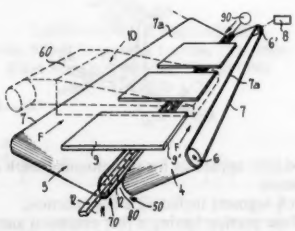
Hans-Peter Caratsch, Itenhardstrasse 16, 5620 Bremgarten, Switzerland

Filed Jun. 30, 1980, Ser. No. 164,188

Claims priority, application Switzerland, Jul. 19, 1979, 6727/79

Int. Cl.³ F27B *9/00*; F26B *19/00*

U.S. Cl. 432—121 **10 Claims**



1. A tunnel furnace for the heat treatment of plate-shaped, substantially flat articles, in particular printed circuit boards, coated at both faces with a curable material, comprising:

a treatment chamber;

conveyor means passing through said treatment chamber for conveying the flat articles with both coated faces of the flat articles being simultaneously exposed in a predetermined conveying direction along a conveying path;

heating means arranged within said chamber and containing a hot air infeed device for applying hot air to the face of the flat articles, said hot air infeed device being arranged at one side of the conveying path of the flat articles; and

a cooling air infeed device arranged within said treatment chamber and at the other side of the conveying path of the flat articles which faces away from said hot air infeed device, said cooling air infeed device applying cooling air to the other side of said flat articles.

4,311,459

INSTALLATION FOR CALCINING FINELY DIVIDED PARTICLES

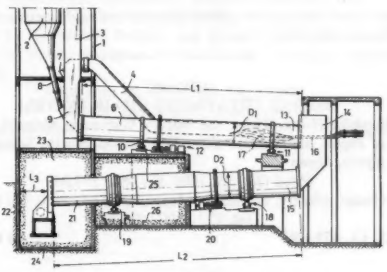
Horst Herchenbach, Troisdorf, and Hubert Ramesohl, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Jul. 2, 1980, Ser. No. 165,291

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1979, 2931197

Int. Cl.³ F27D *1/00*; F27B *7/02*

U.S. Cl. 432—247 **7 Claims**



1. An installation for calcining finely divided particles comprising:

a building having exterior and interior walls,

a pre-heater located in said building,

a relatively short rotary tubular kiln receiving the pre-heated particles from said pre-heater,

a rotary tubular cooler having an inlet and receiving the discharge of said kiln and having a discharge end received in a portion of said building below said pre-heater, said rotary cooler being positioned below said rotary kiln such that particles pass through said kiln in one direction and through said cooler in the opposite direction, and

sound absorbing material surrounding the discharge end of said cooler.

4,311,460

INSULATED INDUSTRIAL OVEN

Duane H. Lauersdorf, Watertown, and Larry A. Camp, Mukwonago, both of Wis., assignors to Wisconsin Oven Corp., East Troy, Wis.

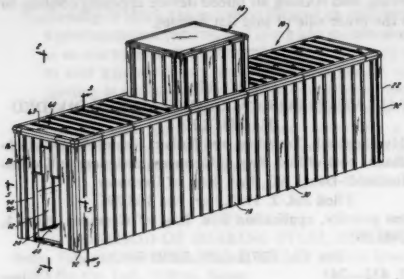
Filed Nov. 17, 1980, Ser. No. 207,440

Int. Cl.³ F27D *1/00*

U.S. Cl. 432—247 **16 Claims**

1. An industrial oven for heating products therein and of the type having four insulated side walls, an insulated top and also a bottom which together define an interior heating chamber, and furthermore being of the type wherein said walls have an inner skin and an outer skin spaced apart from one another and with insulation material therebetween, and a structural steel framework means including generally horizontally disposed steel beams and vertical support posts secured together to form a rigid framework for supporting said skins, said inner and said outer skins each having an interior surface adjacent said framework, the improvement comprising said inner skin being of generally vertically corrugated sheet metal, said structural framework means being located between said inner and outer

skins, said insulation material bearing against said inner skin and spaced from said outer skin to thereby provide a dead air



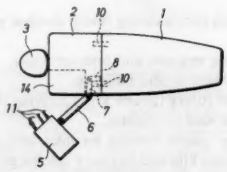
space between said insulation material and said interior surface of said outer skin.

4,311,461

DENTAL TREATMENT CHAIR SYSTEM

Mitsuhiko Hotta, Kyoto, and Minoru Watanabe, Shinnaka, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Oct. 15, 1980, Ser. No. 197,087
Claims priority, application Japan, Oct. 16, 1979, 54/133941
Int. Cl.³ A61G *15/00*
U.S. Cl. 433—33 **6 Claims**



1. A dental treatment chair system having a chair seat, a backrest tiltably mounted to said seat, and a headrest, said system comprising:

at least one unit box assembly connected to said backrest and equipped with a number of dental instruments and flexible connective pipes therefor;

connecting means for allowing said box assembly to be pulled out into any direction from a storage position coextensive with said backrest and to be moved back into said storage position; and

a means for interlocking said box assembly with tilting motions of said backrest and for releasing said box assembly from said tilting motion whereby said box assembly tilts together with said backrest when said box assembly is interlocked with said backrest and said box assembly is freely movable independent of said backrest when released from said backrest.

4,311,462

DENTURES

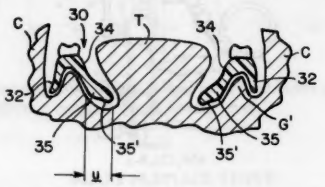
Goro Suga, 1835 N. King St., Honolulu, Hi. 96819

Filed May 8, 1980, Ser. No. 147,743
Int. Cl.³ A61C *13/24*
U.S. Cl. 433—184 **3 Claims**

1. In a denture plate having therein an inverted, generally U-shaped recess for accommodating the lower gum of a wearer, and having thereon a generally arcuate lingual flange forming one boundary of said U-shaped recess, said flange having thereon an inside surface facing on said recess to overlie and embrace the inside of the gum which is seated in said recess, an outside surface generally similar in configuration to said inside surface, and an elongate edge interconnecting said inside and outside surfaces and disposed to extend around said inside of said gum adjacent the base thereof, the improvement comprising,

enlarged rim portions formed on said edge of said flange adjacent opposite ends, respectively, of said recess,

said flange being substantially wider in the areas of said enlarged rim portions, than in the other areas of said flange,



said enlarged rim portions being inclined to said flange so as to project downwardly and inwardly beyond the remaining portions of said edge of said flange, when said plate is in use, thereby slightly to depress and to remain in contact with the floor of a person's mouth during use,

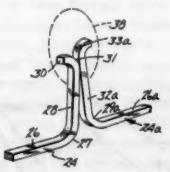
said enlarged rim portions extending at each side of said plate rearwardly from the normal position of the second molars to the posterior or rear ends of said flange, and curving downwardly and inwardly towards the center of said lower plate thereby to extend beneath the rear or inner end of a person's tongue when said plate is in use.

4,311,463

ORTHODONTIC APPARATUS FOR STRAIGHTENING TEETH

Albert D. Glattly, 5851 Duluth St., Golden Valley, Minn. 55422

Filed Aug. 18, 1980, Ser. No. 178,932
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—18 **5 Claims**



1. Orthodontic apparatus for straightening teeth comprising in combination:

(a) an arch segment including a base portion,

(b) said base portion having a first extension and

(c) a second extension spaced from said first extension,

(d) means for securing said base portion to a tooth,

(e) first and second control nodules each of elastic material separate from the material of the arch segment,

(f) said first extension of said arch segment connected to a second extension of another arch segment by said first extension imbedded at its end portion in said first nodule, and

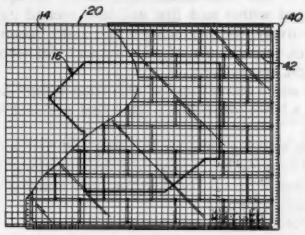
(g) said second extension of said arch segment connected to a first extension of another arch segment by said second extension imbedded at its end portion in said second nodule which normally holds said arch segments in coplanar aligned relationship whereby said arch segments when secured to misaligned teeth and aligned teeth urge said

misaligned teeth to alignment with said arch segments on aligned teeth to a normal aligned relationship.

4,311,464
GRID SYSTEM FOR LAYING OUT AND/OR PRECUTTING TILES OR THE LIKE

Joseph Messina, Philadelphia, Pa., assignor to Michael Cancelliere, Philadelphia, Pa., a part interest

Filed Jul. 14, 1980, Ser. No. 167,906
Int. Cl.³ G09B *19/00*
U.S. Cl. 434—74 **3 Claims**



1. Apparatus for use in optimally arranging covering units, such as tiles or the like, or for precutting such covering units, comprising:

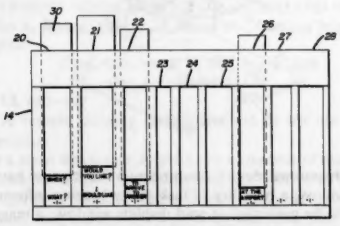
a first grid arranged on a substantially opaque sheet on which the dimensions of a surface to be covered, such as a floor, wall or ceiling, may be scribed or laid out to a predetermined scale; and

a second grid or arrangement arranged on a substantially transparent sheet, said second grid being scaled to correspond to the scaling of said first grid and said second grid or arrangement corresponding to the dimensions and selected arrangement of said covering units to be applied to said surface whereby said second grid corresponding to said covering units may be selectably and optimally positioned over said first grid having thereon the layout of the surface to be covered and the necessary cutting of said covering units may be observed.

4,311,465
LANGUAGE TRANSLATOR

Jose C. Jacobs, 582-B Sycamore, Laredo, Tex. 78041

Filed Mar. 6, 1980, Ser. No. 127,862
Int. Cl.³ G09B *1/28*
U.S. Cl. 434—157 **8 Claims**



1. A device for organizing and translating between first and second languages, said device comprising:

a casing;

a plurality of columns disposed within said casing;

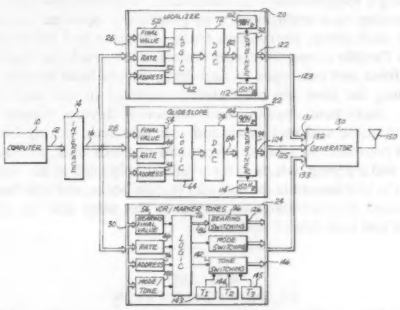
at least first and second overlying cards having first and second sides being disposed in each of said columns with said cards being slidably movable relative to each other; and

said first and second languages being disposed on said cards with said first language being disposed on said first sides of said cards and said second language being being disposed on said second sides of said cards, said second side of said second card containing a translation into said second language of said first language contained on said first side of said first card with such a translating arrangement being followed with respect to all of said cards in said columns.

4,311,466
AUTOMATED AIRCRAFT RADIO NAVIGATION SIMULATOR

Dennis O. Carpenter, Bothell, and Robert E. Ceola, Auburn, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 20, 1979, Ser. No. 50,409
Int. Cl.³ G09B *9/08*; G01S *7/40*
U.S. Cl. 434—242 **22 Claims**



16. Apparatus for automatically simulating an aircraft glideslope or localizer signal, said signal being comprised of the combination of a first signal f_1 of a first frequency and a second signal f_2 of a second frequency, with the sum of the amplitudes of said signals being a constant level K, the apparatus comprising:

control means for generating digital signals representative of the desired final value of the amplitudes of the signals f_1 and f_2 and the rate at which said final value should be approached;

final value register means for receiving and retaining said final value signal;

rate register means for receiving and retaining said rate signal;

logic means for retaining the present value of said glideslope or localizer signal and digitally incrementing, at the rate determined by said rate register retained signal, to said final value as stored in said final value register;

digital to analog converter means for converting said logic means present value, incremental values and final value digital signals to corresponding analog control levels having an instantaneous value of V_c;

means for generator fixed levels of said signals f_1 and f_2; and

combiner means, being responsive to said analog control level V_c, for processing said generated signals f_1 and f_2 such that the amplitude of each is a predetermined function of said control signal V_c and the combined amplitude of said signals f_1 and f_2 is said constant level K.

4,311,467

ASSEMBLY FOR PAIRED FACE TO FACE DENTAL TRAINEES

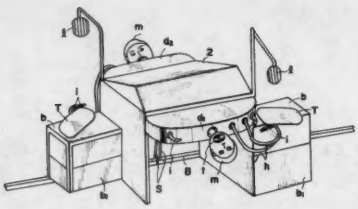
Daryl R. Beach, Atami, and Kazuo Hayashi, Yawata, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Jul. 23, 1980, Ser. No. 171,646

Claims priority, application Japan, Jul. 30, 1979, 54-105647[U]

Int. Cl.³ G09B *23/28*

U.S. Cl. 434—264 **5 Claims**



1. An assembly for paired face to face dental trainees comprising a longitudinally symmetrically combined desk capable of seating two trainees in a longitudinally opposed relation with each other, instruments freely drawable and retractable with flexible connection pipes from and into each end face on the front and rear sides of said desk, human head models including the jaws and protrudently mounted in said each end face, instrument drawing and retraction devices housed in layers inside said each front and rear side desk, storing boxes each provided on said each front and rear side desk, a control unit and a piping unit each for a fluid supply such as air, water and the like housed in each of said storing boxes, and side boxes mounted symmetrically integrally to the same side on each front and rear side of said desk.

4,311,468

PLANET PROJECTION

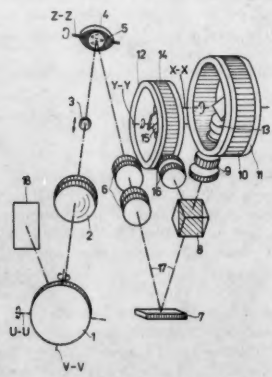
Hans-Jürgen Kiel, Wiegendorf, and Gebhard Kühn, Jena-Lobeda, both of German Democratic Rep., assignors to Jenoptik Jena G.m.b.H., Jena, German Democratic Rep.

Filed Aug. 27, 1980, Ser. No. 179,654

Claims priority, application German Democratic Rep., Sep. 10, 1979, 215420

Int. Cl.³ G09B *27/00*

U.S. Cl. 434—286 **4 Claims**



1. A planet projecting system for simulating the relative motions of a planet in particular to simulate the phase change of the Earth comprising in optical alignment

a first and a second illumination system,

a first and a second hollow cylinder having a transparent curved surface each,

a first transparent photograph representing an image of a planet,

a second transparent photograph representing an image of clouds,

said first and said second image being attached to said curve face of said first and said second cylinder, respectively,

said first and said second illumination system being arranged within said first and said second cylinder, respectively, for producing a first and a second imaging beam, respectively, of said first and said second photograph, respectively,

a first and a second optical distortion system for producing a barrel distortion of said first and said second image,

a beam splitting cube for focusing said first and said second imaging beam to yield a fused imaging beam,

first optical means for directing and imaging said fused imaging beam,

a reflecting means,

a calotte being arranged for rotations about said reflecting means,

second optical means for imaging said fused imaging beam, a reflector,

a planetarium dome for receiving said fused imaging beam from said reflecting means via said second optical means and said reflector.

4,311,469

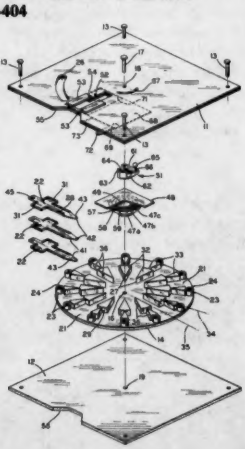
DISPLAY BOARD FOR EDUCATIONAL EXERCISES

Ernest B. Bibbee, 2281 Biard Rd., Fostoria, Ohio 44830

Filed May 16, 1980, Ser. No. 150,564

Int. Cl.³ G09B *1/22*

U.S. Cl. 434—404 **19 Claims**

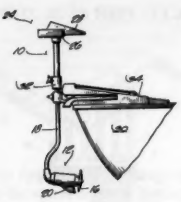


1. An educational device comprising a front panel having a display window; a plurality of task plates bearing information on a face to be presented in said display window; a magazine having a plurality of spaced apart stations each for supporting one of said task plates; means mounting said magazine for movement relative to said front panel behind said front panel along a path which successively brings each station and said task plates into registry with said window, said front panel blocking said task plates from view except for one of said task plates in registry with said window; and means for selectively withdrawing said task plates from said magazine.

4,311,470
TROLLING MOTOR

Clarence E. Blanchard, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Mar. 10, 1980, Ser. No. 128,961
Int. Cl.[3] B63H 5/13
U.S. Cl. 440—6 3 Claims



1. An outboard motor comprising a shaft extending vertically in a normal operating condition and having a lower end, means connected to said shaft for mounting said shaft to a boat, a lower housing fixedly connected to said lower end of said shaft and including a first housing portion having a hollow interior and a second housing portion detachably fixedly connected to said first housing portion and defining therebetween a gear cavity, an electric motor mounted in said hollow interior of said first housing portion and including an output shaft extending into said gear cavity, a propeller shaft rotatably mounted in said second housing portion in co-axial relation to said output shaft and extending into said gear cavity, a propeller carried by said propeller shaft, means within said gear cavity for drivingly connecting said output shaft and said propeller shaft so as to rotate said propeller shaft at a speed less than the speed of said output shaft and so as to facilitate economy of manufacture, said connecting means including a drive gear fixed on said output shaft, a countershaft fixedly supported in parallel relation to said output shaft and against rotation by one of said housing portions and having an outer end positioned closedly adjacent to and unsupported by the other of said housing portions, a compound intermediate gear rotatably mounted on said countershaft and including a first gear portion meshed with said drive gear in driving relation thereto, and a second gear portion integrally joined to said first gear portion in coaxial relation thereto, and a driven gear fixed on said propeller shaft and meshed with said second gear portion in driving relation thereto, and means for restraining said compound intermediate gear against axial movement on said countershaft and including a surface portion formed on said other of said housing portions and located adjacent to said compound intermediate gear.

4,311,471
STEERING MECHANISM FOR OUTBOARD MOTOR

Charles L. Queen, 2243 S. Highland Dr., Camano Island, Wash. 98292

Filed Aug. 20, 1979, Ser. No. 67,806
Int. Cl.[3] B63H 21/26
U.S. Cl. 440—63 4 Claims

1. A remote steering device adapted to for use in a boat comprising:

(a) a stern drive unit mounted to a transom of said boat for rotation about a first horizontal axis between a first lower operating position and a second upper inoperative position, said stern drive unit being steerable from a cockpit portion of said boat,

(b) an outboard motor mounted external of said boat to said transom for rotation about a second horizontal axis between a first lower operative position and a second upper inoperative position,

said remote steering device adapted for attachment to said stern drive unit and said outboard motor in order to steer said outboard motor from said cockpit portion of said boat, said device comprising:

(a) a first bracket adapted to be mounted to said stern drive unit, said first bracket comprising:

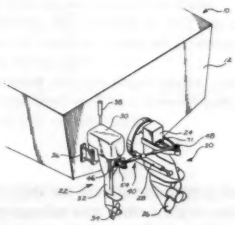
(i) a pair of U-shaped arms having first and second ends, the first ends of the U-shaped arms having mounting portions to engage a front face portion of said stern drive unit, said arms extending along opposite sides of the stern drive unit with the second ends joining to one another at a location directly rearwardly of a rear face portion of the stern drive unit,

(ii) a connecting member connected to the second ends of the arms and engaging said rear face portion of said stern drive unit to rigidly hold said U-shaped arms to said stern drive unit,

(b) a first ball joint connected to said first bracket at the second ends of the arms, said first ball joint having a first ball housing and a first ball member mounted in the first ball housing for rotation about three axes mutually perpendicular to one another,

(c) a second bracket adapted to be attached to said outboard motor at a location rearwardly thereof,

(d) a second ball joint connected to said second bracket at a location directly rearwardly of the outboard motor, said



second ball joint having a second ball housing and a second ball member mounted in the second ball housing for rotation about three axes mutually perpendicular to one another,

(e) a first elongate member having a first longitudinal axis and also having first and second ends, said first end being connected to said first ball joint in a manner to be able to rotate about said first longitudinal axis and also about axes of rotation perpendicular to the first longitudinal axis,

(f) a second elongate member having a second longitudinal axis and having first and second ends, said first end of the second elongate member being connected to the second ball joint to be able to rotate about the longitudinal axis of the second member, and also about axes of rotation perpendicular to the second longitudinal axis,

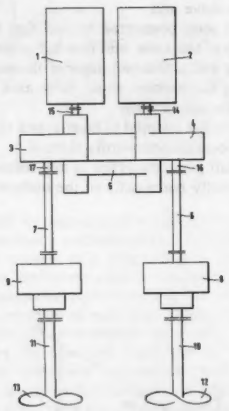
(g) the second ends of the two elongate members being connected to one another to permit relative rotation therebetween about the first and second longitudinal axis, but preventing relative rotation about axes angled to the first and second longitudinal axes,

(h) at least one of said first and second members being a telescoping member capable of having its axial length changed so as to accommodate different distances between the stern drive unit and the outboard motor.

4,311,472
MARINE PROPULSION SYSTEM FOR TWO PROPELLERS

Heinz M. Hiersig, Duesseldorf, and Hans Steinberg, Witten, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 5, 1979, Ser. No. 90,971
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1978, 2850045
Int. Cl.³ F16H *37/06*
U.S. Cl. 440—75 7 Claims



1. A drive and propulsion system for ships, including first and second drive engines, first and second propeller shaft means for connection to first and second propellers respectively, and a gear and transmission system, comprising:

a first and second reducing gear, respectively for connection to the first and second engines, said reducing gears each including an intermediate shaft means connected to the respective engine for being driven by the respective engine, each reducing gear further including pinion means on the intermediate shaft means, the pinion means pertaining to a reducing stage for connecting the intermediate shaft means to an output shaft, the output shafts of the first and second reducing gear being respectively connected to the first and second propeller shaft means for causing the propeller shafts to rotate in opposite directions;

override clutch means for respectively connecting the first and second engines to the intermediate shaft means so that each intermediate shaft means can be drivingly separated from the respective engine;

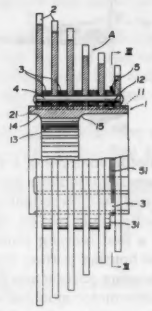
first and second independently operable clutch means respectively connected to the intermediate shaft means, the first and second clutch means further connected to first and second gears, the respective clutch means when operated connecting the respective latter gears to the respective intermediate shaft means; and

gear means for bidirectionally interconnecting the first and second gears so that for the operated first and second clutch means, each intermediate shaft means can drive the respective other one, and the two propeller shafts rotating in opposite directions while, for the released clutches, the gears and gear means are disconnected from either of the intermediate shaft means.

4,311,473
RETAINING DEVICE FOR A MULTI-STAGE SPROCKET ASSEMBLY

Kazuo Sugimoto, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Dec. 5, 1979, Ser. No. 100,294
Claims priority, application Japan, Dec. 12, 1978, 53-171205[U]
Int. Cl.³ F16H *55/12, 55/30*
U.S. Cl. 474—160 6 Claims



1. A multi-stage sprocket assembly comprising a cylindrical member, a sprocket group mounted onto the outer periphery of said cylindrical member, and retaining means provided between said cylindrical member and said sprocket group for preventing said sprocket group from axially moving with respect to said cylindrical member; said cylindrical member having at its outer periphery a plurality of retaining grooves extending axially of said cylindrical member; said sprocket group having two or more different diameter sprockets, one or more ring-like shaped washers positioned between the respective sprockets for keeping them spaced at regular intervals, and coupling means for coupling said sprockets integrally with said washers; each of said sprockets having a central bore fit to the outer periphery of said cylindrical member and being provided at the inner periphery of said central bore with a plurality of projections engageable with said retaining grooves respectively, said retaining means comprising an engaging groove extending circumferentially of said cylindrical member and an engaging member elastically engageable with said engaging groove and disengageable therefrom against the force of elastic engagement, said engaging groove being provided at said cylindrical member and said engaging member being supported by one of said washers, so that said engaging member elastically engages with said engaging groove to retain said sprocket group to said cylindrical member to prevent relative axial movement between them and said engaging member is disengageable from said engaging groove to remove said sprocket group from said cylindrical member.

4,311,474
SYNCHRONOUS BELT AND METHOD FOR MAKING THE SAME

Paul M. Standley, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Sep. 14, 1979, Ser. No. 75,400
Int. Cl.³ F16G *1/28;* B29H *7/22*
U.S. Cl. 474—205 5 Claims

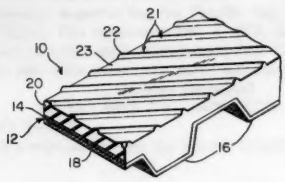
1. An endless power transmission belt comprising:

(a) an endless tensile member of spirally wound cord

(b) a plurality of substantially evenly spaced transverse elastomeric teeth secured to one side of said tensile member

(c) an elastomeric backing layer comprising a plurality of longitudinally spaced ridges defined by alternating projec-

tions and recesses secured to an opposite side of said tensile member, wherein said ridges are oriented at an



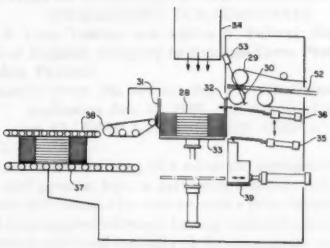
angle which is opposite in direction and at least equal in magnitude to the spiral angle of said cord, with respect to a longitudinal axis of said belt.

4,311,475

COUNTER EJECTOR

Hiroto Imai, Fukuyama, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Dec. 26, 1979, Ser. No. 107,083
Claims priority, application Japan, Dec. 26, 1978, 53-161679
Int. Cl.³ B31B *1/64, 1/98*
U.S. Cl. 493—142 **7 Claims**



1. An apparatus for accumulating and ejecting sheets of paste applied and folded cardboard comprising a hopper, means for accumulating a plurality of said sheets in said hopper, means for delivering said sheets in batches of a prescribed number from said hopper to a next step, a plurality of sheet engaging members, means for alternately reciprocating said engaging members in a vertical direction and alternately projecting said engaging members between said sheets in said hopper to successively project and divide said sheets into batches of said prescribed number and; said means for alternately reciprocating and projecting said engaging members being operable to press an underlying batch of sheets downwardly during a downward portion in the vertical direction taken by said engaging members when reciprocated.

4,311,476

METHOD AND APPARATUS FOR FORMING A CONTAINER FOR LIQUIDS

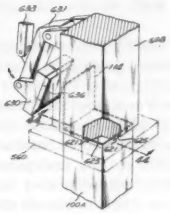
Eric A. Williams, 19599 Somerville Dr., Saratoga, Calif. 95070

Filed Jul. 18, 1979, Ser. No. 58,610
Int. Cl.³ B31B *1/28*
U.S. Cl. 493—176 **3 Claims**

1. In an apparatus for forming a liquid-tight carton from a foldable carton blank, a device for pre-forming the top edges and an end panel extending outward from one of said top edges of said carton blank into a configuration suitable for sealing and bonding said end panel to said carton blank without an internal mandrel comprising:

an anvil adapted to carry said carton blank having an angular recess formed adjacent its top surface;

means for registering said carton blank within said anvil so that said end panel and a portion of said top edges of said carton blank extend above the top surface of said anvil, wherein said registering means comprises a first die including a lower surface adapted to contact said top edges of said carton blank and tightly seat said carton blank upon a support member disposed beneath said anvil, and wherein one sidewall of said first die includes a shallow cavity having tapered walls and a plate member having a surface formed complimentary to said shallow cavity and pivotally mounted adjacent said shallow cavity;



means for creasing said end panel to form a beveled perimeter edge;

means for indenting two corners of said carton blank lying opposite said end panel adjacent said top edges to extend within the interior of said carton blank;

means for folding said portion of said top edges extending above said top surface of said anvil within the interior of said carton blank; and

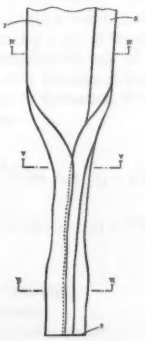
means for pressing said top edges against said angular recess formed in said anvil to form a beveled perimeter along the top edge of said carton blank.

4,311,477

BAG FOR CULTIVATING MUSHROOMS

Ryutaro Kitamura, Kashihara, and Hirotsugu Masubayashi, Kobe, both of Japan, assignors to Polyplastics Company, Ltd., Osaka, Japan

Filed Dec. 26, 1979, Ser. No. 106,955
Int. Cl.³ A01G *1/04*
U.S. Cl. 493—195 **3 Claims**



1. A process for the preparation of a bag suitable for cultivating mushrooms, said process comprising sealing a continuous strip of non-porous film to a continuous strip of polypropylene microporous film reinforced with a non-woven polypropylene web, longitudinally folding the bicomponent sealed strip on itself and sealing the ends thereof, so as to form a continuous tube, cutting said tube into sealable lengths and sealing one end of each of said lengths.

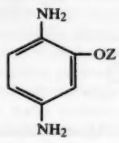
4,311,478

PARAPHENYLENEDIAMINES SUBSTITUTED AT POSITION 2 OF THE BENZENE RING

Andree Bugaut, Boulogne; Alain R. Genet, Neuilly Plaisance, and Koovi G. Dossou, Vert-Galant par Vaujours, all of France, assignors to L'Oreal, Paris, France

Continuation-in-part of Ser. No. 724,581, Sep. 20, 1976, Pat. No. 4,152,112. This application Dec. 4, 1978, Ser. No. 965,873
Claims priority, application France, Sep. 17, 1976, 76 27957
The portion of the term of this patent subsequent to May 1, 1996, has been disclaimed.
Int. Cl.[3] A61K *7/13;* C07C *87/28, 103/32*
U.S. Cl. 8—407 14 Claims

1. A compound having the general formula



(I)

in which Z is selected from the group consisting of hydroxyethyl, methoxyethyl, acetylaminoethyl, carbethoxyaminoethyl, mesylaminoethyl, ureidoethyl, aminoethyl, diethylaminoethyl, and the corresponding acid salts.

4,311,479

METHOD OF INDICATING THE PRESENCE OF AN IMPREGNANT IN A SUBSTRATE

David J. Fenn, London, and Adrian N. Fellows, Ramsbottom, both of England, assignors to Exterma-Germ Products Ltd., London, England

Continuation of Ser. No. 944,621, Sep. 21, 1978, abandoned. This application Jun. 23, 1980, Ser. No. 162,155
Int. Cl.[3] D06P *5/00;* A61L *2/18;* D06P *5/13*
U.S. Cl. 8—495 19 Claims

1. An article consisting of a substrate impregnated with an agent, said agent at least in part being ionically bonded to the substrate and released by contact with a polar liquid, a portion of said impregnated substrate having applied thereto a dye of a kind which will bond ionically to the impregnant more than to the substrate, whereby the disappearance of the dye from the substrate during use thereof will indicate to the user the diminution of the impregnant in the substrate.

4,311,480

DYEING COMPOSITION

Ian M. Price, Glossop, and James K. Skelly, Wilmslow, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 2, 1980, Ser. No. 146,537
Claims priority, application United Kingdom, May 4, 1979, 79155/79
Int. Cl.[3] D06P *67/00*
U.S. Cl. 8—527 11 Claims

1. A composition containing
10 to 60% of a liquid disperse dyestuff preparation,
30 to 55% of a liquid diffusion accelerant,
5 to 20% of an anionic or non-ionic emulsifying agent and
2,5 to 15% of a textile lubricant, the percentages being based on the total weight of the composition.

4,311,481

METHOD FOR IMPROVED DYEING

Eric L. Nelson, Santa Ana, Calif., assignor to Nelson Research & Development Company, Irvine, Calif.

Filed Jan. 23, 1981, Ser. No. 227,630
Int. Cl.[3] D06P *1/649*
U.S. Cl. 8—564 3 Claims

1. A method of enhancing dye penetration of fibers by utilizing in the dyeing process, an effective, dye-enhancing amount of 1-n-dodecylazacycloheptan-2-one.

4,311,482

METHOD AND APPARATUS FOR COLLECTING BLOOD SAMPLES

Erwin F. Workman, Jr., Vernon Hills, and Deborah M. Clark, Gurnee, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 9, 1979, Ser. No. 82,840
Int. Cl.[3] G01N *33/16;* C09K *3/00*
U.S. Cl. 23—230 B 2 Claims

1. In a method for determining platelet factor 4 in a blood sample the improvement comprising treating the blood sample with an effective amount of p-aminobenzoyldiethylaminoethanol or the biologically acceptable acid addition salts thereof to inhibit the in vitro release of platelet factor 4.

2. A partially evacuated blood collection device containing EDTA as an anticoagulant and an effective amount of 2-chloroadenosine and p-aminobenzoyldiethylaminoethanol or the acid addition salts thereof to inhibit in vitro platelet release of platelet factor 4.

4,311,483

KINETIC METHOD FOR DIRECTLY DETERMINING TOTAL BILIRUBIN

Andrew W. Perry, LaHabra, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation-in-part of Ser. No. 49,769, Jun. 18, 1979, abandoned. This application Apr. 21, 1980, Ser. No. 138,062
Int. Cl.[3] G01N *33/50, 33/72, 33/52*
U.S. Cl. 23—230 B 4 Claims

1. A kinetic method for directly determining total bilirubin comprising mixing a sample to be assayed with an azo reagent selected from a group consisting of

(a) a composition having a pH of about 2 and comprising 0.1% w/v boron tetrafluoride salt of diazotized sulfonilic acid dissolved in 50% aqueous methanol;

(b) a composition having a pH of about 6 and comprising 0.1% w/v boron tetrafluoride salt of diazotized sulfonilic acid and a caffeine (5% w/v) - sodium benzoate (10% w/v) mixture dissolved in water; and

(c) a composition having a pH of about 1.4 and comprising 0.4 w/v boron tetrafluoride salt of diazotized sulfonilic acid dissolved in 30% aqueous dimethylsulfoxide;

and measuring the rate of formation of the azobilirubin produced by the reactions:

$$B_{uc} + 2D' \xrightarrow{K_{uc}} A_1 + A_2 + CH_2O + H^+$$

$$B_c + 2D' \xrightarrow{K_c} A_1 + A_2 + CH_2O + H^+$$

wherein

B_{uc} is unconjugated bilirubin;

B_c is conjugated bilirubin;

D' is a diazotized aromatic amine;

K_{uc} and K_c are the rate constants for their respective reactions; and

A_1 and A_2 are azobilirubin isomers;

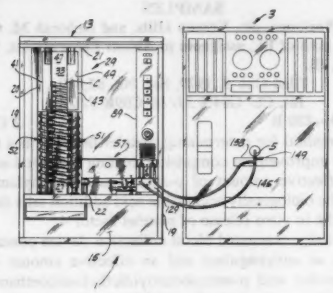
wherein said rate of formation is directly proportional to the total concentration of bilirubin in said sample and wherein K_{uc} is approximately equal to K_c and wherein the half-lives of both reactions are greater than 1 second and less than 5 minutes.

4,311,484

SPECIMEN SAMPLING APPARATUS

Egil Fosslien, Glenview, Ill., assignor to Cortex Research Corporation, Northbrook, Ill.

Filed Apr. 9, 1980, Ser. No. 138,550
Int. Cl.³ G01N *1/14, 33/48, 35/06*
U.S. Cl. 73—864.21 **43 Claims**



27. A method for obtaining a sample from a specimen of blood or the like contained in a closed container at a first pressure and for delivering said sample to an analyzer for analysis, said analyzer having intake means for intake of said specimen sample into the analyzer, said method comprising:

penetrating said closed container with means connected via conduit means to said intake means, said penetrating means having a passage therein with an inlet for entry of a specimen sample into the passage and an outlet for exit of the sample from the passage into said conduit means;

reducing the pressure in said passage and said conduit means to a pressure less than said first pressure thereby to aspirate a specimen sample from the container into said passage and conduit means for delivery to the intake means of the analyzer;

withdrawing said penetrating means from said container following aspiration of the specimen sample from the container, the pressure in said conduit means then being at least equal to said first pressure; and

initiating transfer of specimen sample from said conduit means into said analyzer.

4,311,485

METHOD AND APPARATUS FOR PHOTOMETRICALLY MONITORING THE CONCENTRATIONS OF BOTH CHLORINE AND CHLORINE DIOXIDE

Robert S. Saltzman, Wilmington, Del., and James W. Williams, San Jose, Calif., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

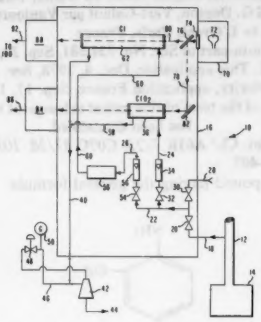
Filed Dec. 23, 1980, Ser. No. 220,200
Int. Cl.³ G01N *20/01, 33/34*
U.S. Cl. 23—230 R **5 Claims**

1. A method for photometrically analyzing a stream under test containing both chlorine and chlorine dioxide comprising the steps of:

(a) photometrically analyzing a first portion of the stream to determine the concentration of chlorine dioxide therein;

(b) heating a second portion of the stream to a predetermined temperature to decompose any chlorine dioxide therein into elemental chlorine;

(c) photometrically analyzing the heated second portion of the stream to determine the concentration of chlorine therein taking into account the chlorine produced by the



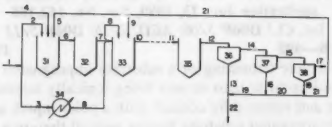
decomposition of the chlorine dioxide and the concomitant dilution produced thereby.

4,311,486

PROCESS FOR PRODUCING COARSE GRAINS OF ALUMINUM HYDROXIDE

Koichi Yamada; Takuo Harato; Hisakatsu Kato, and Yasumi Shiozaki, all of Niihama, Japan, assignors to Sumitomo Aluminium Smelting Company, Limited, Osaka, Japan

Filed Aug. 5, 1980, Ser. No. 175,535
Claims priority, application Japan, Aug. 13, 1979, 54/103295
Int. Cl.³ B01D *9/02*
U.S. Cl. 23—301 **16 Claims**



1. In a process for producing coarse grains of aluminum hydroxide from sodium aluminate solution, which comprises dividing supersaturated sodium aluminate solution being prepared by the Bayer process and having a molar ratio of Na_2O as caustic soda to Al_2O_3 in solution of less than 1.8 into two streams of sodium aluminate solution, adding aluminum hydroxide as seed to one of the streams of sodium aluminate solution, partially decomposing the seed-added stream until the molar ratio of the sodium aluminate solution reaches 1.8–2.6, adding the other stream of sodium aluminate solution, which has been cooled to a temperature low enough to lower the temperature of the partially decomposed stream of sodium aluminate solution in a slurry state at least by 3° C., to the partially decomposed stream of sodium aluminate slurry, and decomposing the mixed slurry of sodium aluminate until a molar ratio of the mixed slurry reaches at least 2.6, the improvement comprising adding a portion of recycle seed aluminum hydroxide and fine grains of aluminum hydroxide as seed to one of the streams of sodium aluminate solution, the fine grains of aluminum hydroxide added as seed having an average grain size of less than 10 μm, partially decomposing the sodium aluminate solution until the molar ratio of the sodium aluminate solution reaches 1.8–2.6, adding to the resulting partially decomposed sodium aluminate slurry the other stream of sodium aluminate solution, which has been cooled to a temperature low enough to lower the temperature of the partially decomposed sodium aluminate slurry by at least 3° C., and the remaining portion of recycle seed aluminum hydroxide, and then further decomposing the cooled and mixed sodium alumi-

nate slurry until the molar ratio of the sodium aluminate slurry reaches 2.6–4.0.

4,311,487
RECRYSTALLIZATION OF ACTIVATED RARE-EARTH OXYHALIDE PHOSPHORS

George W. Luckey, and Christine M. Towers, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 11, 1980, Ser. No. 158,192
Int. Cl.³ C09K *11/46*
U.S. Cl. 23—305 RE **14 Claims**

1. A method for recrystallizing an activated rare-earth oxyhalide phosphor comprising the steps of

(1) forming a substantially homogeneous mixture comprising said rare-earth oxyhalide phosphor and a flux and

(2) firing said mixture in an inert atmosphere at a temperature above the melting point of said flux wherein

said flux comprises substantially dehydrated magnesium halide having a water content between about 0 and 3 moles of water/mole of magnesium halide

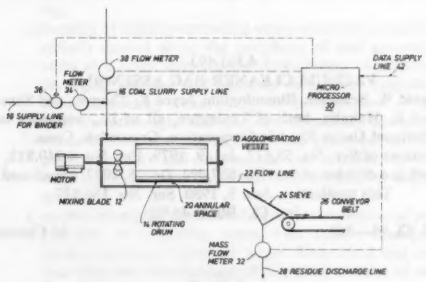
and wherein the halide of said oxyhalide and said magnesium halide is bromide or chloride.

2. The method of claim 1 wherein said flux further comprises an alkali metal halide wherein the molar ratio of said activated rare-earth oxyhalide:dehydrated magnesium halide:alkali metal halide is within the range 1.00:0.20–1.00:0.20–0.75.

4,311,488
PROCESS FOR THE UPGRADING OF COAL

Eke Verschuur, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 12, 1980, Ser. No. 215,789
Claims priority, application Netherlands, Feb. 6, 1980, 8000730
Int. Cl.³ C10L *5/16*
U.S. Cl. 44—10 R **10 Claims**



1. In a process for upgrading relatively fine coal particles which are suspended in an aqueous liquid by treating such a suspension as an aqueous slurry of feed solids and mixing it with an oil-phase binder, agitating the resultant slurry to agglomerate coal particles, and then separating the agglomerated particles from the slurry, the improvement for increasing the cost-effectiveness of the coal particle agglomerating and separating process by using a ratio of binder to feed solids which substantially minimizes both the proportion of the residual non-agglomerated solids which remain within the slurry after the agglomerated particles have been separated from the slurry and the ratio of binder to feed solids, comprising:

mixing and agglomerating measured amounts of feed solid particles and binder;

removing the agglomerated particles and measuring the proportion of the feed solid particles which were not agglomerated and not removed;

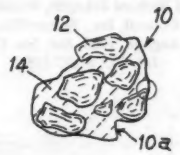
repeating said agglomerating and measuring steps while using a different ratio of binder-to-feed solid particles and measuring the resultant proportion of feed solid particles not agglomerated and not removed; and

using a ratio of binder-to-feed solid particles having a value such that an incremental increase in the ratio causes only a relatively small decrease in the proportion of feed solid particles which are not agglomerated, since the ratio used has a value corresponding to a substantially asymptotic portion of a curve of the variation in proportion of non-agglomerated feed solid particles with increase in the ratio of binder-to-feed solid particles.

4,311,489
COATED ABRASIVE HAVING BRITTLE AGGLOMERATES OF ABRASIVE GRAIN

Bernhardt E. Kressner, Pittsford, N.Y., assignor to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 931,035, Aug. 4, 1978, abandoned. This application Mar. 10, 1980, Ser. No. 129,186
Int. Cl.³ B61L *29/08*
U.S. Cl. 51—298 **2 Claims**



1. A coated abrasive product having abrasive particles secured to a flexible backing by maker and size coats, each abrasive particle consisting of an essentially solid agglomerate of fine abrasive grains having an average diameter less than about 200 microns and an inorganic, brittle cryolite, matrix, the volume percent of the matrix in each agglomerate being at least 45% of the total solids volume of the agglomerate, said agglomerates having an irregular surface permitting a strong bond to the maker and size coats which permits gradual wearing down of the agglomerates during grinding by gradual removal of dulled abrasive grains from the agglomerates, the matrix bond serving to limit the depth of penetration into the workpiece of the individual abrasive grains during the grinding action and thereby providing the surface finish comparable to the surface finish utilizing unagglomerated abrasive grains of the grit size of the individual grains in the agglomerates.

4,311,490
DIAMOND AND CUBIC BORON NITRIDE ABRASIVE COMPACTS USING SIZE SELECTIVE ABRASIVE PARTICLE LAYERS

Harold P. Bovenkerk, and Gordon M. Kibler, both of Worthington, Ohio, assignors to General Electric Company, Worthington, Ohio

Filed Dec. 22, 1980, Ser. No. 219,289
Int. Cl.³ C09C *1/68*
U.S. Cl. 51—307 **24 Claims**

1. In a process for preparing a compact which comprises:

A. placing within a protective shield metal enclosure which is disposed within the reaction cell of a high pressure/high temperature apparatus:

(1) a mass of abrasive crystals selected from the group consisting of diamond and cubic boron nitride; and

(2) a mass of catalyst metal selected from the group consisting of cobalt, nickel, iron, mixtures and/or alloys thereof, and aluminum alloy catalysts useful only with cubic boron nitride;

B. subjecting the contents of the shield metal enclosure to the following conditions:

(1) for diamond

(a) a pressure of at least 50 Kbars at a temperature of at

least 1300° C. and within the diamond stable region; and

(b) a reaction time of 3–120 minutes;

(2) for cubic boron nitride

(a) a pressure of at least 42 Kbars at a temperature of at least 1300° C. and within the cubic boron nitride stable region; and

(b) a reaction time of about 2–120 minutes; and

C. recovering the composite compact produced;

the improvement which comprises disposing the mass of abrasive crystals in Step A. in layers, the coarsest layer being closest to the catalyst metal and being comprised of crystals having a largest dimension of between about 75 and about 500 micrometers, and the finest layer being disposed farthest away from the catalyst metal and being comprised of crystals having a largest dimension of less than 10 micrometers.

4,311,491

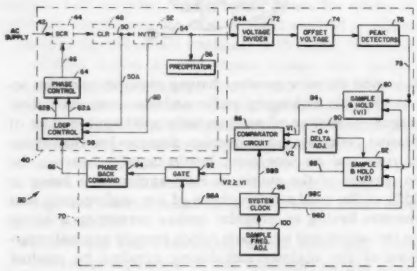
ELECTROSTATIC PRECIPITATOR CONTROL FOR HIGH RESISTIVITY PARTICULATE

Peter P. Bibbo, High Bridge; Frederick E. Hankins, Flemington, both of N.J., and Richard Jakoplic, Woodston, Kans., assignors to Research Cottrell, Inc., Somerville, N.J.

Filed Aug. 18, 1980, Ser. No. 179,254

Int. Cl.³ B03C *3/66*

U.S. Cl. 55—2 **15 Claims**



1. A control circuit for an electrostatic precipitator comprising:

(a) primary control means for applying and adjusting electrode input power to said precipitator in response to at least one sensed and fed back operating parameter of said precipitator;

(b) voltage conditioning means connected to said precipitator for providing a replica of the instantaneous electrode voltages associated with said electrode input power;

(c) a peak detector connected to said voltage conditioning means for detecting the peak magnitude of said replicated instantaneous voltages and for producing an envelope voltage representative thereof;

(d) means for successively taking first and second samples of said envelope voltage and for holding said samples between said successive sample takings;

(e) comparator and feedback means for determining when said second sample is greater than or equal to said first sample and for thereupon applying an electrode input power feedback signal to said primary control means to thereby adjust said input power.

4,311,492

VACUUM TUBE FILTER COVER

Frank Eltvedt, 5 Lake Dr., Lake In The Hills, Ill. 60102

Filed Sep. 22, 1980, Ser. No. 189,799

Int. Cl.³ B01D *46/54*

U.S. Cl. 55—158 **11 Claims**

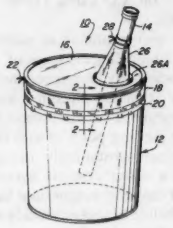
5. A filter cover for use with an open top container into which a suction tube extends for removing particulate material therefrom, comprising

a planar, transparent, flexible sheet,

means for sealably securing said sheet to said container over said open top thereof,

an opening in said sheet through which said suction tube is adapted to extend into said container,

means for sealing said tube to said sheet around said opening, and



filter means incorporated in said cover for removing liquid and other entrained particles from the ambient air passing through said filter means into said container,

said filter means comprising a tubular section of filter cloth sealably fastened at one end to said sheet over said opening and adapted to be sealably fastened at the other end to said suction tube.

4,311,493

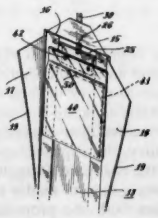
VACUUM CLEANER BAG ASSEMBLY

Harold W. Schaefer, Bloomington; Joyce K. Thomas, and Samuel E. Hohulin, both of Lexington, all of Ill., assignors to National Union Electric Corporation, Greenwich, Conn.

Division of Ser. No. 55,617, Jul. 9, 1979, Pat. No. 4,240,812, which is a division of Ser. No. 857,094, Dec. 5, 1977, abandoned. This application Jun. 3, 1980, Ser. No. 156,127

Int. Cl.³ B01D *46/02*

U.S. Cl. 55—369 **16 Claims**



8. In a vacuum cleaner assembly including a vacuum cleaner having an air outlet, a porous container enclosing a filter bag and having an inlet mounted to receive air from said air outlet and direct it to said filter bag, and wherein said container has a closure through which said filter bag may be replaced; the improvement further comprising a hanger mounted within said container, and pocket means on said hanger for holding spare filter bags within said container.

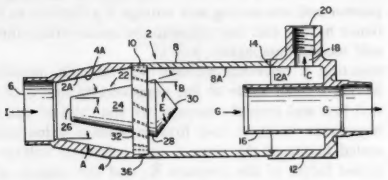
4,311,494
AXIAL FLOW GAS CLEANING DEVICE

Wayne L. Conner, Warren, and William G. Martin, Bloomfield Hills, both of Mich., assignors to Facet Enterprises, Inc., Tulsa, Okla.

Continuation of Ser. No. 831,712, Sep. 26, 1977, abandoned, which is a continuation-in-part of Ser. No. 640,136, Dec. 12, 1975, abandoned. This application Dec. 3, 1979, Ser. No. 99,359

Int. Cl.³ B01D *45/16*

U.S. Cl. 55—394 **2 Claims**



1. A separator device for concentrating particles dispersed in a flowing gas stream comprising:

a tubular housing have an inlet section at one end and an outlet section at the opposite end, said inlet section receiving said flowing gas stream therethrough;

said tubular housing having an intermediate diverging section having a relatively small inside diameter end immediately adjacent to said inlet section and a relatively large inside diameter end remote from said inlet section; and

a generator body disposed within said tubular housing and mounted in a generally centrally located position therein, said generator body further comprising:

a first diverging section disposed in said intermediate diverging section, said first diverging section having a relatively small diameter end disposed adjacent said inlet section and a relatively large diameter section disposed adjacent to said larger inside diameter end of said intermediate diverging section of said tubular housing;

a plurality of radially extending vanes disposed circumferentially spaced about the periphery of said generator body at a point immediately downstream of said first diverging section, said plurality of radially extending vanes extending transversely to the direction of gas flow therethrough, said plurality of radially extending vanes having one end adjacent the periphery of said generator body and an opposite end attached to said large inside diameter end of said intermediate diverging section;

a second diverging section mounted downstream of said plurality of extending vanes, said second diverging section having a relatively larger diametrical end section than said relatively large diameter section of said first diverging section; and

a rearward section mounted downstream of said relatively larger diametrical end section of said second diverging section to reduce the velocity of the flowing gas stream;

whereby said flowing gas stream having particles dispersed therein is introduced through said inlet section of said tubular housing so as to flow into said first diverging section of said generator body and into said intermediate diverging section of said tubular housing with said particles dispersed in said flowing gas stream acting on said first diverging section of said generator body and being imparted with a radial momentum vector, said radial momentum vector further moving said particles in the outermost region of said flowing gas stream through said first and intermediate diverging sections to concentrate said particles in the outermost region, whereby a tangential velocity component is imposed on said particles and said radial momentum vector is further enhanced when said particles in said flowing gas stream pass through said plurality of radially extending vanes and said particles are further acted on by said plurality of vanes such that said particles are further concentrated in the outermost of said flowing gas stream in said housing, whereby said flowing gas stream further flowing past said second diverging section with said particles dispersed in said flowing gas stream further being acted on by said second diverging section of said generator body and said radial momentum vector is still further enhanced to further concentrate said particles in the most outer region of said flowing gas stream and whereby said flowing gas stream is further made to flow past said rearward section to reduce the velocity of said flowing gas stream immediately downstream thereof without inducing flow separation.

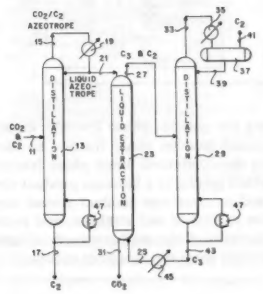
4,311,495
SEPARATING CARBON DIOXIDE AND ETHANE BY LIQUID-LIQUID EXTRACTION

Ralph E. Styring, Jr., Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 28, 1979, Ser. No. 108,202

Int. Cl.³ F25J *3/02*

U.S. Cl. 62—17 **4 Claims**



1. A method for separating a mixture of carbon dioxide and ethane derived from a prior separation stage, said method comprising:

(a) passing a liquid azeotrope of carbon dioxide and ethane into an extraction unit, said azeotrope having been derived from a prior carbon dioxide separation stage;

(b) passing a liquid hydrocarbon comprised of at least three carbon atoms into said extraction unit in a manner and quantity such that said liquid azeotrope and said liquid hydrocarbon mix and a substantial portion of said ethane in said azeotrope is extracted with said liquid hydrocarbon;

(c) removing a first fluid stream from said extraction unit, said first fluid having a greater concentration of carbon dioxide than said liquid azeotrope, and

(d) removing a second fluid stream from said extraction unit, said second fluid being comprised of said hydrocarbon liquid and ethane extracted from said liquid azeotrope.

4,311,496
PRELIMINARY CONDENSATION OF METHANE IN THE FRACTIONATION OF A GASEOUS MIXTURE

Rainer Fabian, Geretsried, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Mar. 31, 1980, Ser. No. 135,556

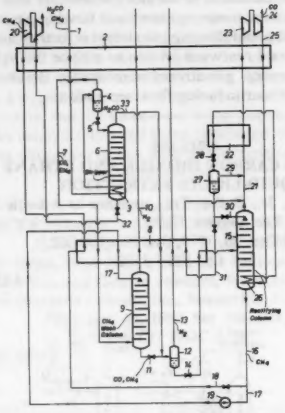
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1979, 2912761

Int. Cl.³ F25J *3/00*

U.S. Cl. 62—17 **11 Claims**

1. In a process for the fractionation of a gaseous mixture

comprised of hydrogen, methane, and carbon monoxide, comprising a methane wash conducted in a methane wash column at a relatively low temperature, the improvement comprising subjecting the gaseous mixture which contains at least 25% by volume of methane, prior to the methane wash, to a partial condensation at a temperature higher than the relatively low temperature of the methane wash, thereby obtaining a gaseous phase fraction and a condensed liquid phase fraction, additionally cooling the gaseous phase fraction, conducting the additionally cooled gaseous phase fraction to the methane wash, conducting the condensed liquid phase fraction to a stripping column which produces a bottoms product stream comprising methane and an overhead product stream comprising hydrogen, carbon monoxide and methane, and recovering methane from the bottoms of the methane wash column in a rectifying column distinct from the stripping column.



4,311,497

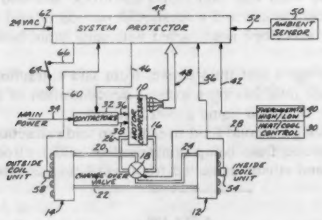
METHOD AND APPARATUS FOR HEAT PUMP SYSTEM PROTECTION

Dennis E. Newell, El Segundo, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 883,481, Mar. 6, 1978, abandoned, which is a continuation of Ser. No. 733,225, Oct. 18, 1976, abandoned. This application Nov. 15, 1979, Ser. No. 94,431

Int. Cl.[3] **F25B** *13/00*

U.S. Cl. 62—158 **9 Claims**



1. A method of controlling an apparatus in accordance with relationships of interrelated variables of the form

$$P_A \cong K_1 + sP_B$$

$$P_B \cong K_1 + sP_A$$

where P_A and P_B are the variables, s is the slope of a straight line and K_1 is a limiting constant, said method comprising the steps of:

converting P_A and P_B to substantially linearly related voltages V_A and V_B, respectively;

connecting the voltage V_A through an impedance having a first value to the noninverting input of a first comparator and connecting voltage V_A through an impedance having a second value to the inverting input of a second comparator;

connecting the voltage V_B through an impedance having said second value to the inverting input of said first comparator and connecting said voltage V_B through an impedance having said first value to the noninverting input of said second comparator; and

connecting a reference voltage V_R through impedances having a third value to the noninverting inputs of both said first and second comparators, the ratio of said third impedance value to said first impedance value being a scaled factor of the slope s, said reference voltage is a scaled factor of the constant K_1 and the outputs of the comparators being signals representative of when the relationships are met or exceeded.

4,311,498

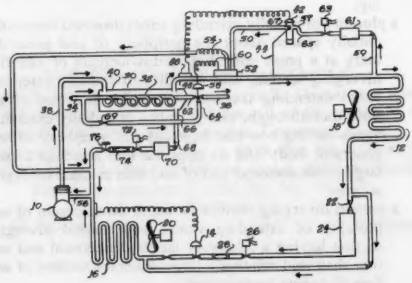
DESUPERHEATER CONTROL SYSTEM IN A REFRIGERATION APPARATUS

Donald K. Miller, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jul. 14, 1980, Ser. No. 168,921

Int. Cl.[3] **F25D** *17/00;* **F25B** *27/02*

U.S. Cl. 62—181 **5 Claims**



1. A desuperheater control system for use in a refrigeration apparatus including a compressor, a condenser, an expansion device, and an evaporator, all suitably interconnected to form a closed refrigerant circuit, said system comprising:

heat recovery means coupled between the discharge side of the compressor and the inlet of the condenser;

pilot valve means responsive to temperature and pressure at the outlet of said heat recovery means for bypassing refrigerant flow from said condenser back to the suction side of said compressor;

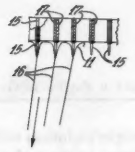
a pressure chamber connected to the outlet of said pilot valve means to sense pressure therein; and

water regulating valve means responsive to the pressure in said pressure chamber for regulating the water flow through said heat recovery means so that the superheated refrigerant from the compressor is cooled to a pre-selected temperature having a minimum superheat.

4,311,499
APPARATUS AND METHOD FOR PRODUCTION OF MINERAL FIBERS

Arnold J. Eisenberg; Neil E. Greene, and Hellmut I. Glaser, all of Granville, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sep. 8, 1980, Ser. No. 185,110
Int. Cl.³ C03B *37/025*
U.S. Cl. 65—1 **9 Claims**

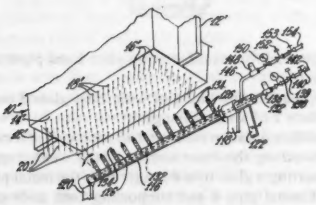


1. A mineral fiber forming bushing comprising:
(a) upwardly extending sidewalls; and
(b) a bottom wall extending between the sidewalls comprising a plurality of tubular members attached together at their adjacent sides to form a rigid structure adapted for flow of molten mineral material through the tubular members from a supply above to form a layer of molten material along the undersurface of the tubular members, the undersurface of the tubular members generally forming the undersurface of the bushing, and rod members projecting below the undersurface of the tubular members, the rod members being attached to the tubular members and being adapted for flow thereon of the molten mineral material from the undersurface of the tubular members for attenuation into fibers.

4,311,500
METHOD OF AND MEANS FOR REMOVAL OF GLASS FLOODS FROM A SURFACE OF A GLASS STREAM FEEDER

Cletis L. Roberson, and Roland E. Langlois, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 23, 1980, Ser. No. 161,955
Int. Cl.³ C03B *17/025*
U.S. Cl. 65—2 **24 Claims**

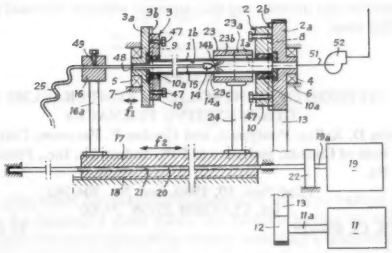


1. The method of controlling molten glass at a surface of a substrate having orifices from which flow streams of molten glass including supplying a heat-decomposable liquid carbonaceous material to a glass flood on a surface area of the substrate, decomposing the liquid carbonaceous material at the region of the glass flood on the substrate under the influence of the high temperature environment of the substrate and molten glass to release carbon particles from the carbonaceous material, and removing the glass flood from the substrate surface by the carbon particles.

4,311,501
METHOD AND APPARATUS FOR THE PRODUCTION OF PREFORMS FOR OPTICAL FIBRES

Francois Fort, and Pierre Zimmermann, both of Paris, France, assignors to Societe Anonyme dite: les Editions Filmees, Paris, France

Continuation-in-part of Ser. No. 50,142, Jun. 19, 1979, abandoned. This application Mar. 11, 1980, Ser. No. 129,344
Claims priority, application France, Jun. 23, 1978, 78 18892; Jun. 19, 1979, 80 00412
Int. Cl.³ C03C *25/02*
U.S. Cl. 65—3.11 **10 Claims**



5. A method for producing an optical fiber with index gradient, said optical fiber including an elongated tubular substrate having one or more layers of doped transparent substance thereon, said method including the steps of:
supporting said tubular substrate by its first and second ends;
rotating said tubular substrate about its axis;
applying a layer of said doped transparent along the length of said tubular substrate by moving a well-defined spray stream of said substance between said tubular substrate first and second ends; and
heat treating said doped transparent substance by localized heating of said tubular substrate adjacent said well-defined spray stream as said spray stream is moved between said ends of said tubular substrate.

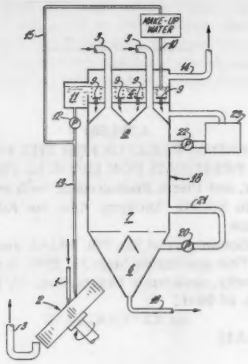
4,311,502
WET SCRUBBING-PELLETIZING METHOD

Mark A. Propster, Gahanna, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 27, 1980, Ser. No. 201,641
Int. Cl.³ C03B *5/16*
U.S. Cl. 65—27 **12 Claims**

1. A process for reducing particulate content in gases discharged from a pellet preheating system which comprises forming pellets of particulate matter in a pelletizing zone in contact with an aqueous solution, passing the pellets in a contact zone in counter-current contact with hot gases to dry and preheat the pellets and to cool the gases and to entrain particulate matter in the gases, passing the gases in contact

with a liquid in a liquid contact zone to remove gaseous and particulate matter from said gases and to form an aqueous



solution and introducing said aqueous solution into said pelletizing zone.

4,311,503

METHOD OF CONTROLLING TEMPERATURE OF GLASS EXITING FURNACES

John D. Kellar, Pontypool, and Gordon F. Pereman, Columbus, both of Canada, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 10, 1980, Ser. No. 204,762
Int. Cl.³ C03B *25/08, 27/00*
U.S. Cl. 65—29 **11 Claims**

1. A method of heating each of a series of glass sheets having thicknesses varying over a thickness range to a substantially uniform furnace exit temperature comprising conveying each glass sheet in turn at a timed interval through an enclosed heating furnace to a check station in a soaking area near the exit of said furnace while undergoing exposure to a predetermined amount of radiation per unit area when it arrives at said check station, whereby a sheet of less thickness obtains a higher developed temperature and a sheet of greater thickness obtains a lesser developed temperature on its arrival at said check station, exposing said sheet at said check station to heating means delivering radiation at a higher heat intensity than said developed temperature to soak said sheet, maintaining said sheet at said check station for a unique soaking time for said sheet depending on the developed temperature of said sheet, said soaking time ranging from the minimum soaking time needed to heat the sheet from its developed temperature to a target temperature to a maximum soaking time that does not exceed said timed interval, and rapidly removing said sheet from said enclosed furnace either when it attains said target temperature or when said timed interval expires before said sheet attains said target temperature.

4,311,504

METHOD OF COATING GLASS OR CERAMICS WITH A COLORED FRIT

Jaroslava M. Nigrin, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 15, 1980, Ser. No. 121,746
Int. Cl.³ C03C *17/04*
U.S. Cl. 65—32 **2 Claims**

1. A method for coating a glass, glass-ceramic, or ceramic body with a glaze exhibiting a bright red coloration which comprises the step of:

(a) mixing a powdered frit consisting essentially, in weight percent on the oxide basis as calculated from the batch, of

SiO_2	35–47
B_2O_3	5.5–9
BaO	24–42
TiO_2	1.5–4
ZrO_2	6–10
Li_2O	1–5
MgO	0–5
CaO	0–4
SrO	0–8
ZnO	0–10
Bi_2O_3	0–8
SrO + MgO + CaO + ZnO + Bi_2O_3	0–10

with 2–10% by weight cadmium sulfoselenide;

(b) applying said mixture to the surface of said glass, glass-ceramic, or ceramic body; and

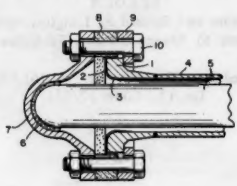
(c) firing said body to about 700°–950° C. in a non-oxidizing or inert environment for a sufficient length of time to cause said frit to flow and produce a smooth homogeneous coating.

4,311,505

METHOD OF MANUFACTURING GLASS-LINED METAL TUBES

Tadashi Yasui, Kobe; Isamu Nakamura, Amagasaki, and Shigeo Goto, Kobe, all of Japan, assignors to Sybron Corporation, Rochester, N.Y.

Filed Oct. 30, 1980, Ser. No. 202,071
Claims priority, application Japan, Nov. 6, 1979, 54-144070
Int. Cl.³ C03C *27/02, 27/04*
U.S. Cl. 65—43 **1 Claim**



1. A method for manufacturing glass-lined pipes comprising the steps of:

(a) applying a thin lining of undercoat glass **3** onto the end surface **2** of a metal flange **1**;

(b) welding a flange member **1** to each end of a metal pipe **4**;

(c) smoothing the inner surface of the welded region;

(d) inserting a glass tube **5** longer than the metal pipe into the said metal pipe **4** and supporting both ends of the glass tube by conical caps **7** and cushion material **6**;

(e) mounting said caps on both flange portions of the metal pipe;

(f) surrounding the outer periphery of each flange end surface with an air permeable spacer ring **8**; and

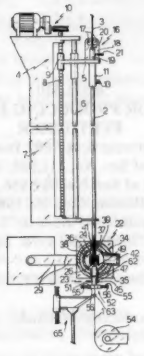
(g) heating the assembled units to soften the glass tube and inflating the glass tube by internal pressure so that continuous glass coating is provided from the inner surface of the metal pipe to the end surface of the flange member.

4,311,506

METHOD AND APPARATUS FOR CONTINUOUSLY PRODUCING VERY SMALL DIAMETER METAL WIRE HAVING A GLASS COATING THEREOVER

Giovanni Manfre', Vinovo, and Vittorio Pellegrini, Novara, both of Italy, assignors to Centro Ricerche Fiat S.p.A., Torino, Italy

Filed Nov. 24, 1980, Ser. No. 210,134
Claims priority, application Italy, Nov. 26, 1979, 69273 A/79
Int. Cl.[3] C03C 27/02
U.S. Cl. 65—59.6 25 Claims



1. A method for continuously producing very small diameter metal wire from molten material, comprising at least one heating stage for heating in a first predetermined position a glass tube in which a wire of metal material is disposed, these being fed in the direction of their longitudinal axis in such a manner as to cause said glass to soften to a required viscosity and said material to melt in order to form a wire, and a cooling stage for cooling, in a second predetermined position, said wire on which a required traction is exerted, characterised in that said second predetermined position in which said wire cooling stage is carried out is located, with respect to said first position, in such a location along the wire axis that solidification of said material takes place in a section situated not before the limiting section at which the reduction in cross-section of said wire terminates, the quantity of heat removed during said cooling stage being sufficiently high to prevent softening of the glass of said tube downstream of said limiting section.

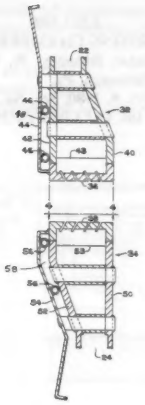
12. An apparatus for continuously producing very small diameter metal wire from molten material, comprising heating means for heating in a first predetermined position a glass tube in which a wire of metal material is disposed, these being fed in the direction of their longitudinal axis, said heating means being arranged to cause said glass to soften to a required viscosity and said material to melt in order to form a wire, cooling means for cooling said wire and means for exerting a predetermined traction on the wire, characterised by comprising means for adjusting the relative position of said heating means to said cooling means along the axis of the wire under formation in such a manner that solidification of said material takes place in a section, along the axis of said wire, which is situated not before the limiting section at which the reduction in cross-section of said wire terminates, said cooling means being arranged to remove a quantity of heat which is sufficiently high to prevent softening of the glass of said tube downstream of said limiting section.

4,311,507

SPECIAL ENTRANCE SLIT MODULE AND METHOD FOR QUENCHING GLASS SHEETS

Eugene W. Starr, Allison Park, and George B. Shields, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 21, 1980, Ser. No. 170,471
Int. Cl.[3] C03B 27/04
U.S. Cl. 65—114 6 Claims



1. A glass sheet temperating apparatus of the type having a furnace for heating a glass sheet, the furnace having an exit end; upper elongated quenching means, including a transverse wall; lower elongated quenching means, including a transverse wall; means for mounting said upper and lower quenching means with their transverse wall spaced from the exit end of the furnace with said lower elongated quenching means in spaced relation to and facing said upper quenching means, wherein a tempered glass sheet made by moving a heated glass sheet from the furnace through and between the upper and lower quenching means has a predetermined kink resulting from the spaced distance between the transverse wall of the quenching means and exit end of the furnace, the improvement comprising:

a baffle wall connected in spaced relation to and substantially coextensive with each transverse wall of the upper and lower quenching means to provide an open-ended compartment therebetween; and

pipe means mounted in each of said compartments in a manner to permit the flow of a cooling gas across and through each compartment.

6. In a method of tempering a glass sheet in an apparatus of the type having a furnace for heating a glass sheet, the furnace having an exit end; upper elongated quenching means, including a transverse wall; lower elongated quenching means, including a transverse wall; means for mounting the upper and lower quenching means with their transverse wall spaced from the exit end of the furnace with the lower quenching means in spaced relation to and facing the upper quenching means, wherein the method includes the steps of moving a heated glass sheet through the furnace to heat the sheet to a temperature sufficient for subsequent temper; and moving the heated sheet between the upper and lower quenching means to temper the sheet wherein the sheet has a predetermined kink resulting from the spaced distance between the transverse wall of the quenching means and exit end of the furnace, the improvement comprising:

providing a baffle wall in spaced relation to and substantially coextensive with each transverse wall of the upper and lower quenching means to provide an open-ended compartment therebetween;

moving cooling fluid through pipe means mounted in each compartment; and

flowing gas across and through each compartment wherein said step of moving cooling fluid and of flowing gas minimizes thermal damage to the transverse wall of the quenching means by the furnace to permit a reduction in the spaced distance between the exit end of the furnace and the transverse wall of the quenching means to reduce kink in the tempered sheets.

4,311,508

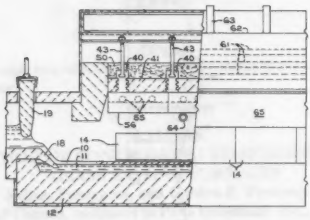
FLOAT GLASS FORMING CHAMBER WITH CAST ROOF

Ronald L. Schwenninger, Ridgeley, W. Va., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 8, 1980, Ser. No. 195,282

Int. Cl.³ C03B *18/16*

U.S. Cl. 65—182.5 **7 Claims**



1. An apparatus for producing flat glass by the float process comprising: an elongated enclosure adapted to hold a pool of molten metal, means for delivering a stream of molten glass into the enclosure onto the molten metal, and means for drawing the glass along the length of the enclosure and for withdrawing the glass from the enclosure as a formed ribbon; the improvement comprising a substantial portion of the roof of the enclosure being constructed of a plurality of anchor members affixed to support means above the enclosure, and refractory material cast around the anchor members in the form of a substantially horizontally extending slab having a substantially planar bottom surface facing the interior of the enclosure.

4,311,509

APPARATUS FOR CONVEYING GLASS SHEETS

William D. Reader, Altoona, and Terry L. Wolfe, Tyrone, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 26, 1980, Ser. No. 191,470

Int. Cl.³ C03B *27/04*

U.S. Cl. 65—351 **14 Claims**

1. A conveyor roll for conveying glass sheets comprising:

(a) a curved rigid shaft having at least a portion thereof provided with an elevational shape conforming to the transverse shape of glass;

(b) means for supporting said curved shaft at its ends so that said curved portion extends transversely of a path of movement for said glass sheets;

(c) a plurality of hubs of essentially cylindrical configuration mounted around said curved shaft in end to end relation with one another from one end hub at one end of said plurality of hubs to another end hub at the other end of said plurality of hubs, said hubs having loosely interfitting tongues and grooves at the axial ends of adjacent of said hubs that form loose interfitting tongue and groove couplings capable of transmitting a torque between adjacent of said hubs while permitting a limited freedom of axial movement between said adjacent hubs;

(d) a cylindrically shaped collar of a material that does not mar glass in tightly fitting relation around each of said hubs;

(e) means for applying a torque to one of said end hubs; and

(f) means mounted around said shaft and against the other of said end hubs to bias said hubs in an axial direction sufficiently to retain a loosely fitting relation between said tongues and grooves and to enable said hubs to transmit a torque applied to said one end hub through said hubs to said other end hub, whereby said collars rotate in unison at a uniform peripheral speed.

4,311,510

METHOD FOR PRODUCING HIGH-GRADE FERTILIZER

Gernot Graefe, Bergstrasse 6, A 7082 Donnerskirchen, Austria

Continuation-in-part of Ser. No. 111,988, Jan. 14, 1980, which is a continuation-in-part of Ser. No. 812,856, Jul. 5, 1977, Pat. No. 4,211,545. This application Oct. 28, 1980, Ser. No. 201,540

Claims priority, application Austria, Jul. 7, 1976, 4977/76; May 18, 1977, 3581/77; Mar. 27, 1979, 2287/79; Jun. 19, 1979, 4330/79

Int. Cl.³ C05F *11/08*

U.S. Cl. 71—9 **10 Claims**

1. A method for producing a fertilizer and decay promoting material comprising:

(a) subjecting a mass of grape marc to aerobic decay wherein:

1. the sugar content of the marc is converted to alcohol which reacts with organic acids produced from microbial fermentation and the acids and alcohols react to produce esters;

2. rearranging the decaying marc to facilitate access of air thereto to promote penetration of the mycelia of *Humicola lanuginosa* and thermophilic actinomycetes into the mass,

3. rearranging the mass into a loose form to effect microbial degradation of the mycelia;

(b) drying the mass.

4,311,511

METHOD FOR PRODUCING HIGH-GRADE FERTILIZER

Gernot Graefe, Bergstrasse 6, A 7082 Donnerskirchen, Austria

Continuation-in-part of Ser. No. 812,856, Jul. 5, 1977, Pat. No. 4,211,545. This application Jan. 14, 1980, Ser. No. 111,988

Claims priority, application Austria, Jul. 7, 1976, 4977/76; May 18, 1977, 3581/77; Mar. 27, 1979, 2287/79; Jun. 19, 1979, 4330/79

Int. Cl.³ C05F *11/08*

U.S. Cl. 71—9 **11 Claims**

1. A method for producing a fertilizer and decay promoting material comprising:

(a) subjecting a mass of grape marc to aerobic decay wherein:

1. the sugar content of the marc is converted to alcohol which reacts with organic acids produced from bacterial fermentation and the acids and alcohols react to produce esters;

2. rearranging the decaying marc to facilitate access of air thereto to promote penetration of the mycelia of a thermophilic actinomycete into the mass;

3. rearranging the mass into a loose form to effect microbial degradation by the actinomycete mycelia; and

(b) drying the mass and separating a pip-containing fraction.

4,311,512
BACTERICIDAL WATER-SOLUBLE COMPLEXES

Herbert Schwartz, 1963 N. Maurice River Pkwy., Vineland, N.J. 08360

Continuation-in-part of Ser. No. 525,844, Nov. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 139,844, May 3, 1971, abandoned. This application Feb. 8, 1978, Ser. No. 876,062

The portion of the term of this patent subsequent to May 13, 1997, has been disclaimed.

Int. Cl.³ A01N *43/64, 33/12*

U.S. Cl. 71—67 **25 Claims**

1. A water-soluble complex comprising a quaternary ammonium salt and a tricyclic, cage-type heterocycle containing four nitrogen atoms selected from the group consisting of hexamethylenetraamine, 1,3,6,8-tetraazatricyclo-(4,4,1,$1^{3,8}$)-dodecane, 4,5,9,10-dibenzo-1,3,6,8-tetraazatricyclo-(4,4,1,$1^{3,8}$)-dodecane and 4(5), 9(10)-dimethyl-1,3,6,8-tetraazatriccylo-(4,4,1,$1^{3,8}$)-dodecane in molar ratios of 1:4 and 3:2.

17. A method of killing microorganisms comprising contacting the microorganisms with a lethal amount of a complex of claim **1**.

4,311,513
HERBICIDAL α-PHENOXYPROPIONYLAZOLES, COMPOSITIONS CONTAINING THEM, AND METHOD OF USE THEREOF

Beat Böhner, Binningen, and Hermann Rempfler, Ettingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

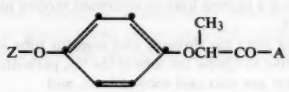
Filed Aug. 14, 1980, Ser. No. 178,220

Claims priority, application Switzerland, Aug. 24, 1979, 7727/79

Int. Cl.³ A01N *43/50, 43/56, 43/66;* **C07D** *401/12*

U.S. Cl. 71—92 **17 Claims**

1. An α-phenoxypropionylazole of the formula I



(I)

wherein X is 3,5-dichloropyrid-(2)-yl or 3-chloro-5-trifluoromethyl-pyrid-(2)-yl, and A is an polyazole radical which is bonded through a ring nitrogen atom and which can be substituted by one or more of halogen, alkyl, alkoxy, alkylthio or perfluoroalkyl, each containing at most 4 carbon atoms, by cyano, carboxyl, and carbalkoxy containing at most 4 carbon atoms in the alkoxy moiety, or by C_1–C_4alkanoyl, and A can also denote a salt of a diazole or a triazole.

10. A method of selectively controlling monocotyledonous weeds in crops of cultivated plants which method comprises applying thereto a herbicidally effective amount of an α-phenoxypropionylazole according to claim **1**.

4,311,514
SULFUR-CONTAINING ALKANECARBOXYLIC ACID DERIVATIVES WITH HERBICIDAL AND PLANT GROWTH-REGULATING ACTION, PRODUCTION THEREOF AND METHOD OF USE

Henry Szczepanski, Rheinfelden; Otto Rohr, Therwil, and Hermann Rempfler, Ettingen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

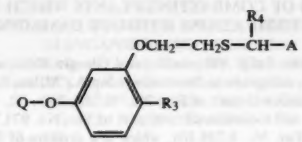
Filed Sep. 2, 1980, Ser. No. 183,613

Claims priority, application Switzerland, Sep. 13, 1979, 8297/79

Int. Cl.³ A01N *43/40, 41/00, 31/04;* **C07C** *149/31*

U.S. Cl. 71—94 **14 Claims**

1. A compound of the formula



wherein

Q is 2,4-dichlorophenyl, 3,5-dichloropyrid-2-yl, 2-chloro-4-trifluoromethylphenyl or 3-chloro-5-trifluoromethylpyrid-2-yl,

R_3 is halogen, nitro or cyano,

R_4 is hydrogen or methyl, and

A is a C_1–C_{18} alkoxycarbonyl or a C_2–C_8 alkoxyalkoxycarbonyl group.

4,311,515
SUBSTITUTED DIPHENYL ETHERS HAVING HERBICIDAL ACTIVITY

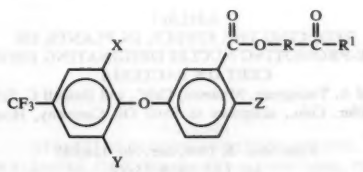
William S. Grove, Doylestown, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 25, 1980, Ser. No. 172,319

Int. Cl.³ A01N *37/40;* **C07C** *79/46*

U.S. Cl. 71—108 **8 Claims**

1. A compound represented by the formula:



wherein:

X is hydrogen or halogen;

Y is hydrogen, halogen, cyano, trifluoromethyl, or alkyl containing up to 4 carbon atoms;

Z is nitro, halogen, or cyano;

R is alkylidene or monosubstituted alkylidene containing 1 to 3 carbon atoms wherein the substituent is alkyl containing 1 to 4 carbon atoms; and

R^1 is hydrogen or alkyl containing 1 to 10 carbon atoms.

7. A herbicidal formulation containing an inert carrier and a herbicidally effective amount of a compound or mixture of compounds defined in claim **1**.

8. In a method of controlling weed growth wherein a herbicidally effective amount of herbicide is either applied to the growth medium prior to emergence of the weeds or applied to the weeds subsequent to emergence from the growth medium, wherein the improvement resides in using as the herbicide a herbicidally effective amount of a compound or mixture of compounds defined in claim **1**.

4,311,516

METHOD OF COMBATTING PLANTS WHICH INFEST MAIZE CULTIVATIONS WITHOUT DAMAGING THE MAIZE

Franco Gozzo; Luigi Abbruzzese, and Giorgio Siddi, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

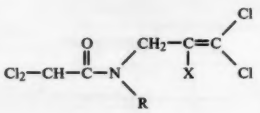
Continuation-in-part of Ser. No. 98,788, Nov. 30, 1979, abandoned, and a continuation-in-part of Ser. No. 971,713, Dec. 21, 1978, Pat. No. 4,228,101, which is a division of Ser. No. 846,351, Oct. 28, 1977, Pat. No. 4,195,036. This application Apr. 10, 1980, Ser. No. 139,091

Claims priority, application Italy, Oct. 29, 1976, 28867 A/76; Dec. 23, 1977, 31189 A/77

Int. Cl.[3] A01N *37/44, 37/18*

U.S. Cl. 71—111 10 Claims

1. Method for combatting infesting plants of a maize cultivation without damaging the maize, which comprises treating the infested maize with from 3 to 5 kg/ha of herbicidal N-di-lower-alkyl phenyl, N-chloroacetylglycines and with, depending on the quantity of said herbicidal N-substituted glycines used, from at least 0.05 to 0.125 kg/ha. of an antidote having the general formula



in which

X is chlorine; and

R is a methyl, ethyl, allyl, 3,3-dichloroallyl, 2,3,3-trichloroallyl, or 1,1-dimethylpropargyl group.

4,311,517

REDUCING THE EFFECT, IN PLANTS, OF ICE-PROMOTING NUCLEI ORIGINATING FROM CERTAIN BACTERIA

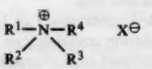
Edward A. Youngman, Modesto, Calif., and Russell C. Schnell, Boulder, Colo., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 3, 1980, Ser. No. 126,635

Int. Cl.[3] A01N *33/12*

U.S. Cl. 71—121 3 Claims

1. A method for minimizing damage in a plant to be subjected to a low temperature, which plant is infested with one or both of the species of bacteria *Erwinia herbicola* and *Pseudomonas syringae,* which comprises applying to the above-ground portion of the plant before it is subjected to the low temperature a compound of the formula



(I)

wherein R^1 is alkyl, alkenyl or alkylphenalkyl of 8 to 20 carbon atoms, or phenalkyl of 7 to 20 carbon atoms, R^2 and R^3 each is alkyl of 1 to 6 carbon atoms, R^4 is alkyl, alkenyl, phenalkyl or alkylphenalkyl of 1 to 20 carbon atoms, and X is an anion, the amount of said compound being sufficient to significantly reduce the ice-nucleating effect of said bacteria but not being toxic to the plant.

4,311,518

HOMOGENIZATION OF METAL USING GAS

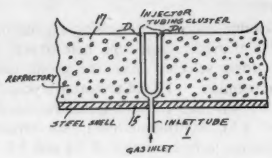
Guy Savard, Westmount, and Robert G. H. Lee, Montreal, both of Canada, assignors to Canadian Liquid Air Ltd./Air Liquide Canada Ltee, Montreal, Canada

Filed Oct. 16, 1980, Ser. No. 197,514

Claims priority, application Canada, Oct. 31, 1979, 338904

Int. Cl.[3] C21C *5/34*

U.S. Cl. 75—59 10 Claims



1. A method of treating molten metal with a gas comprising

(a) providing a vessel for molten metal, said vessel including a casing having a refractory lining and a metal injector tube passing through said casing and terminating at a tip at an inwardly facing surface of said refractory lining; said injector tube delivering inert gas under pressure to molten metal in said vessel, and having a fine bore of a diameter effective to prevent penetration of molten metal into and along said bore,

(b) introducing a first load of untreated molten metal into said vessel,

(c) delivering inert gas through said injector tube and into said molten metal at a pressure effective to agitate and homogenize said molten metal,

(d) discontinuing the delivery of said inert gas and allowing molten metal to solidify on the tip of said tube to seal it,

(e) removing homogenized molten metal from said vessel,

(f) introducing a second load of untreated molten metal into said vessel,

(g) delivering inert gas through said injector tube at a pressure effective to unseal the tube at the tip, permitting entry of said inert gas into said second load, and

(h) agitating said second load of molten metal with said inert gas to homogenize it.

4,311,519

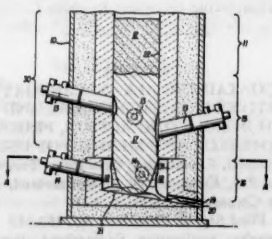
MELTING FURNACE FOR GRANULATED METAL

Milton E. Berry, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Dec. 26, 1979, Ser. No. 107,462

Int. Cl.[3] C22B *15/00;* F27B *1/02*

U.S. Cl. 75—72 24 Claims



1. A vertical shaft furnace for melting copper without the intentional addition of fuel or fluxes to the copper and without clogging said furnace which comprises a cylindrical barrel vertically mounted upon a cylindrical melting chamber having

a diameter larger than that of said barrel immediately above, said barrel being divided into a cylindrical upper preheat chamber adapted to receive and preheat a gravity charge of copper at ambient temperature, a sintering chamber located between said cylindrical upper chamber and said melting chamber and adapted to heat said preheated copper charge to a temperature only slightly below the melting temperature of copper and which is a sintering temperature for copper whereby said copper passes through said sintering chamber and a cylindrical melting chamber, including burner means for tangential and direct application of heat to said preheated copper charge, said melting chamber being adapted to receive said coherent columnar mass from said sintering chamber and continuously melt said columnar mass from the periphery thereof toward the inner portions thereof by the tangential and direct application of heat to said columnar mass and means for collecting and draining molten copper from said melting chamber as said coherent mass is melted.

4,311,520
PROCESS FOR THE RECOVERY OF NICKEL, COBALT AND MANGANESE FROM THEIR OXIDES AND SILICATES

Paul R. Kruesi, Golden, and Veryl H. Frahm, Jr., Boulder, both of Colo., assignors to Cato Research Corporation, Wheat Ridge, Colo.

Filed Feb. 28, 1980, Ser. No. 125,465
Int. Cl.³ C22B *47/00, 4/00*
U.S. Cl. 75—80 **19 Claims**

1. In a process for the recovery of a metal selected from the group consisting of nickel, cobalt and manganese from an ore material comprising an oxide or silicate of said metal and gangue, wherein the recovery process utilizes heat, the improvement in combination therewith comprising the step of subjecting said ore material to microwave energy wherein said microwave energy is preferentially absorbed by the metal oxide or silicate over the gangue and wherein the process involves a chemical reaction of the metal oxide or silicate.

4,311,521
MEMBRANE SEPARATION OF CATALYST METALS FROM TRIMELLITIC ACID PRODUCTION AND SEPARATION OF COBALT FROM MANGANESE

Jon J. Harper, Naperville, and Stephen J. Pietsch, Oak Park, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

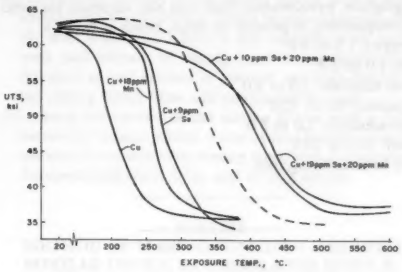
Filed Oct. 1, 1980, Ser. No. 192,913
Int. Cl.³ C22B *3/00*
U.S. Cl. 75—101 BE **6 Claims**

1. A method of separately recovering cobalt and manganese from residue obtained by removal of substantial trimellitic acid and, if used, reaction solvent from the product of the oxidation with a source of molecular oxygen of liquid pseudocumene in the presence of cobalt and manganese as metal oxidation catalyst, which method comprises extracting the residue with from 0.25 up to 6 weight parts of water per one weight part of residue at a temperature of from 25° C. up to 100° C., contacting at a temperature of from 25° C. up to 100° C. the extract solution or combination of said solution and insoluble portion of the residue with one side of a cation permeable fluoropolymer membrane whose other side is in contact with hydrochloric acid or hydrobromic acid, upwardly adjusting the pH of the hydrochloric or hydrobromic acid solution now containing ions of the catalyst metals to a pH of 6 while adding powdered manganese in a gram atom amount chemically equivalent to the dissolved cobalt to precipitate it as metallic cobalt, and recovering such metallic cobalt with magnetic separator thereby providing an aqueous solution of manganese.

4,311,522
COPPER ALLOYS WITH SMALL AMOUNTS OF MANGANESE AND SELENIUM

Ravi Batra, Rockaway, and Pierre W. Taubenblat, Highland Park, both of N.J., assignors to Amax Inc., Greenwich, Conn.

Filed Apr. 9, 1980, Ser. No. 138,803
Int. Cl.³ C22C *9/00*; C27C *9/05*
U.S. Cl. 75—153 **22 Claims**



1. A cold worked copper-base alloy having high electrical conductivity and improved resistance to recovery, recrystallization and grain growth at elevated temperatures consisting essentially of small but effective amounts of manganese and selenium to increase the half-hour softening temperature of the cold worked alloy at least about 100° C. above that of the unalloyed copper base for a given amount of cold work while maintaining the electrical conductivity above about 100% International Annealed Copper Standard (IACS), less than about 20 ppm oxygen, and the balance essentially copper.

3. A cold worked copper-base alloy having an electrical conductivity above about 100% International Annealed Copper Standard (IACS) and improved resistance to recovery, recrystallization and grain growth at elevated temperatures consisting essentially of from about 4 to about 100 ppm manganese, about 4 to about 100 ppm selenium, less than about 20 ppm oxygen, and the balance essentially copper.

4,311,523
TITANIUM-BORON ADDITIVE ALLOYS

Leon A. Luyckx, 226 E. Hazelcroft Ave., New Castle, Pa. 16105

Filed May 5, 1980, Ser. No. 146,452
Int. Cl.³ C22C *14/00*
U.S. Cl. 75—175.5 **11 Claims**

1. A high concentration titanium-boron additive alloy for addition to liquid metal such as steel comprising about 70% titanium, about 1.75% boron and the balance iron with usual residual impurities in amounts not exceeding about 5%.

8. A high concentration titanium-boron additive alloy for addition to liquid metal such as steel comprising about 65% to 90% titanium, about 1.3% to 4.5% boron and the balance iron with usual residual impurities in amounts not exceeding about 5%, said alloy having a ratio of titanium to boron in the range 30/1 to 50/1 with the titanium and iron contents at approximately the titanium iron eutectic.

10. A high concentration titanium-boron additive alloy for addition to liquid metal such as steel comprising about 65% to 90% titanium, about 1.3% to 4.5% boron and the balance iron with usual residual impurities in amounts not exceeding about 5%, said alloy having a ratio of titanium to boron of about 40/1 with the titanium and iron contents at approximately the titanium iron eutectic.

4,311,524

SINTERED IRON-BASED FRICTION MATERIAL

Valery A. Genkin, ulitsa Gaya, 38, kv.52; Alexandr A. Dmitrovich, bulvar Lunacharskogo, 5, kv.71, and Efim I. Fishbein, ulitsa Brilevskaya, 14, kv.11, all of Minsk, U.S.S.R.

Filed Apr. 1, 1980, Ser. No. 136,304

Int. Cl.³ C09K *3/14, 3/18*

U.S. Cl. 75—231 2 Claims

1. A sintered iron-based friction material comprising copper, tin, graphite, pyroceramic, lead, and zinc sulphide, the ratio of the components, in percent by mass, being as follows:

copper: 1.5 to 3.0
tin: 1.0 to 2.0
zinc sulphide: 2.0 to 4.0
graphite: 6.0 to 10.0
pyroceramic: 2.0 to 5.0
lead: 10.0 to 20.0
the balance being iron.

4,311,525

SLIDING MEMBER FOR USE IN INTERNAL COMBUSTION ENGINE

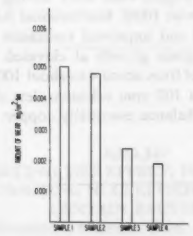
Yoshikatsu Nakamura, Omiya, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Sep. 5, 1979, Ser. No. 72,749

Claims priority, application Japan, Sep. 22, 1978, 53-115888

Int. Cl.³ B22F *5/00*

U.S. Cl. 75—240 4 Claims



1. A sliding member for use in an internal combustion engine having a sliding surface formed by a sprayed layer consisting of metal carbide and molybdenum, said sprayed layer consisting of 95.5 to 99.5% by weight of metal carbide with the remainder being molybdenum, the hardness of said metal carbide being in a range of Hv 750 to Hv 2,000.

4,311,526

γ2 - FREE, LOW COST AMALGAM ALLOY POWDERS

Pei Sung, 30 Buckspark Ct., Potomac, Md. 20854

Continuation-in-part of Ser. No. 61,982, Jul. 30, 1979, abandoned. This application Aug. 5, 1980, Ser. No. 175,378

Int. Cl.³ C22C *30/00*

U.S. Cl. 75—255 2 Claims

1. A dental alloy powder consisting of a mixture of 75% to 95% by weight of metal alloy powder which consists of 45% to 60% silver, 26% to 33% tin balance pure copper and 5% to 25% by weight of silver-copper alloy powder which consists of minimum 45% silver balance copper.

4,311,527

ISOINDOLINE COLORANTS

Wolfgang Lotsch, Beindersheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

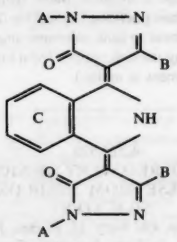
Filed Mar. 4, 1980, Ser. No. 127,146

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1979, 2909644

Int. Cl.³ C09D *11/02*

U.S. Cl. 106—22 11 Claims

1. In a colored polymer or coating composition, the improvement which comprises using a coloring amount of a colorant therefor which is a compound of the formula I:

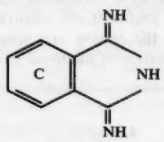


(I)

where A is hydrogen or phenyl, and

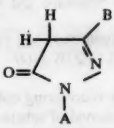
B is hydrogen, C_1–C_4 alkyl, phenyl or carbo-C_1–C_4-alkoxy, the phenyl radicals and the ring C being unsubstituted or substituted by groups which do not confer solubility, and the four groups A and B may be identical or different from one another;

wherein said compound is prepared by condensing one mole of a diiminoisoindoline of the formula II:



(II)

with two same or different moles of a pyrazolone of the formula III:



(III)

4,311,528

ROOT FILLING PASTE FOR DENTAL SURGERY

Georg Dietz, Mauerkircher Str. 120, 8000 München 81, and Hans-Helmut Barth, Jücklinstr. 21, München 83, both of Fed. Rep. of Germany

Filed Aug. 5, 1980, Ser. No. 175,825

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1979, 2932738

Int. Cl.³ C09K *3/00*

U.S. Cl. 106—35 5 Claims

1. A root filling paste for dental surgery comprising from about 45 to 65% by weight calcium hydroxide, from about 13 to 33% by weight of an X-ray contrast agent, and from about 12 to 32% by weight oleum pedum tauri.

4,311,529
TINTED OPAL GLASS

Paul S. Danielson, and John E. Megles, Jr., both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jun. 17, 1980, Ser. No. 160,388
Int. Cl.³ C03C *3/04*
U.S. Cl. 501—32 **2 Claims**

1. A spontaneous opal glass, wherein CaF_2 crystals constitute the opacifying phase, which, after thermal tempering, exhibits a dense coloration ranging from ivory through yellow-beige to tan to a grayish-brown appearance, consisting essentially, expressed in weight percent on the oxide basis, of 8–9% Na_2O, 2–2.5% K_2O, 5–6.5% CaO, 8–10% ZnO, 1–2% B_2O_3, 10–11% Al_2O_3, 3–4% F, 0.005–0.1% NiO, 0–2% CeO_2, 0–4% TiO_2, 0.5–6% CeO_2+TiO_2, 0–0.5% As_2O_3, and 57–61% SiO_2, said coloration depending upon the quantities of NiO, CeO_2, and TiO_2 utilized.

4,311,530
CONCRETE MIX AND PROCESS FOR THE MANUFACTURE OF CHEMICALLY STABLE STRUCTURES AND ARTICLES THEREFROM

Anatoly N. Pimenov, ulitsa Sudostroitelnaya, 14/16, kv. 120; Ivan E. Putlyaev, Profsojuznaya ulitsa, 75, korpus 1, kv. 53; Vladimir A. Otrepiev, ulitsa Belovezhskaya, 1, kv. 22; Evgeny A. Guzeev, ulitsa Novo-Alexeevskaya, 4, korpus 2, kv. 37; Natalya F. Shesterkina, ulitsa Molostovykh, 4, korpus 4, kv. 363, all of Moscow; Vasily V. Paturoev, Oktyabrsky prospekt, 164, kv. 32, Ljubertsy Moskovskoi oblasti, and Dmitry A. Pankovsky, B. Akademicheskaya, 73, korpus 1, kv. 47, Moscow, all of U.S.S.R.

Filed Jul. 15, 1980, Ser. No. 169,182
Int. Cl.³ C04B *19/04*
U.S. Cl. 106—84 **12 Claims**

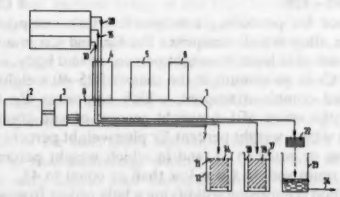
1. A concrete mix comprising: a binding agent based on liquid glass; a fine-dispersed active filler of the group of volcanic water-containing glass of a fraction of from 0.01 to 0.1 mm particle size; an acid-alkali-stable aggregate selected from the group consisting of sand and a mixture of sand and rubble at a weight ratio ranging from 1:1.07 to 1:1.25, wherein said components are present in the mix in the following proportions, in % by weight:

binder	9–14
active filler	19–32
aggregate	the balance.

4,311,531
METHOD FOR CLEANING MIXING DEVICES

Dietmar Bege, Erlangen, and Anwer Puthawala, Erlangen-Buckenhof, both of Fed. Rep. of Germany, assignors to Kraftwerk Union AG, Mülheim, Fed. Rep. of Germany

Filed Mar. 7, 1980, Ser. No. 128,274
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1979, 2910708
Int. Cl.³ B08B *3/08, 7/04, 9/00*
U.S. Cl. 134—10 **10 Claims**



1. Method for cleaning mixing devices having an exhaust steam line and a discharge opening, used for embedding radioactive wastes in hot bitumen, to remove residual bitumen and salt incrustations, which comprises cleaning the interior of the mixing device by the following successive steps:

(a) washing the interior of the mixing device with a volume amount of an organic solvent in which bitumen is soluble, said amount of solvent being at least equal to the volumetric capacity of the mixing device, and then discharging the solvent from said mixing device;

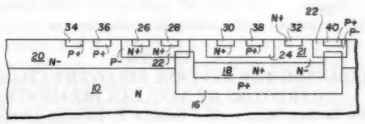
(b) rinsing the interior of the mixing device with a volume amount of a water-soluble rinsing liquid completely miscible with water and which is also miscible with said solvent, said amount of rinsing liquid being approximately the same as said amount of solvent, and then discharging the rinsing liquid from said mixing device; and

(c) rinsing the interior of the mixing device with a volume amount of demineralized water approximately twice said amount of water-soluble rinsing liquid and discharging the demineralized water from said mixing device.

4,311,532
METHOD OF MAKING JUNCTION ISOLATED BIPOLAR DEVICE IN UNISOLATED IGFET IC

David L. Taylor, Carrollton, Tex., assignor to Harris Corporation, Melbourne, Fla.

Filed Jul. 27, 1979, Ser. No. 61,775
Int. Cl.³ H01L *21/263, 21/02, 21/20, 29/72*
U.S. Cl. 148—1.5 **10 Claims**



1. A process of fabricating an integrated circuit including complementary insulated gate field effect transistors and a junction isolated bipolar device comprising:

diffusing first P type impurities into an N conducting type substrate to form a first P type region;

epitaxially forming an N type layer on said substrate;

implanting second P type impurities in the surface of said epitaxial layer to form a second P type region;

diffusing said first P type region up and said second P type region down into said epitaxial layer until they overlap to isolate a third N-type region of said epitaxial layer from the remainder of the epitaxial layer;

diffusing first N type impurities into said second P type region to form source and drain regions of an N channel device and into said third N type region to form a first region of said bipolar device; and

diffusing third P type impurities into said epitaxial layer to form source and drain regions of a P channel device and into said third N type region to form a second region of said bipolar device.

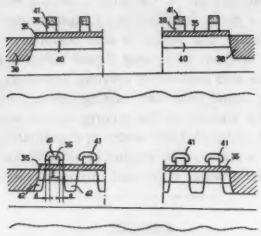
4,311,533
METHOD OF MAKING SELF-ALIGNED DIFFERENTLY DOPED REGIONS BY CONTROLLED THERMAL FLOW OF PHOTORESIST LAYER

Marcel Roche, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 20, 1980, Ser. No. 161,572
Claims priority, application France, Jun. 22, 1979, 79 16055
Int. Cl.³ H01L *21/26;* B05D *3/04, 3/12*
U.S. Cl. 148—1.5 **7 Claims**

1. A process for the self-alignment of differently doped regions in a silicon substrate, comprising the steps of:

(a) coating this substrate with successive layers of thin silica, silicon nitride and photosensitive resin,
(b) opening in a corresponding way windows in the resin and nitride layers, while maintaining nitride regions covered with resin,
(c) causing the resin to flow in a controlled way with overflowing with respect to the nitride regions to define a first implantation mask,



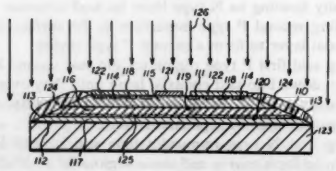
(d) implanting a first dopant,
(e) removing by selective etching the resin layer,
(f) increasing the thickness of the thin oxide layer at the positions not covered with nitride,
(g) removing by selective etching the nitride regions,
(h) using the second mask defined by the differences of thickness of the remaining oxide layer to implant a second dopant.

4,311,534

REDUCING THE REVERSE RECOVERY CHARGE OF THYRISTORS BY NUCLEAR IRRADIATION

John Bartko, Monroeville; Krishan S. Tarneja; Chang K. Chu, both of Pittsburgh, and Earl S. Schlegel, Plum Borough, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 27, 1980, Ser. No. 163,548
Int. Cl.³ H01L *21/263, 29/167, 7/54*
U.S. Cl. 148—1.5 **6 Claims**



1. A method of reducing the reverse recovery charge of thyristors without substantially increasing forward voltage drop comprising the steps of:
(A) determining the depth of an anode PN junction from a major surface adjoining a cathode-emitter region of a thyristor;
(B) determining the depth of maximum defect generation in the thyristor on irradiation through said major surface with a given radiation source radiating particles with molecular weight of at least one;
(C) adjusting the energy level at said major surface of the thyristor from said radiation source to provide the depth of maximum defect generation adjacent the anode PN junction of the thyristor;
(D) thereafter irradiating the thyristor through said major surface with said energy level from said radiation source to a given dosage to reduce the reverse recovery charge of the thyristor.

4,311,535

COMPOSITION FOR FORMING ZINC PHOSPHATE COATING OVER METAL SURFACE

Kiyotada Yasuhara; Masashi Takahashi, both c/o Nippon Paint K.K. 1-15 Minami Shinagawa 4-Chome,, Shinagawa-ku, Tokyo; Ryoichi Murakami, and Takashi Senzaki, both of c/o Nippon Paint K.K. 19-17, Ikeda Nakamachi, Neyagawa-shi, Osaka, all of Japan

Filed May 1, 1980, Ser. No. 145,586
Claims priority, application Japan, May 11, 1979, 54-58341
Int. Cl.³ C23F *7/08*
U.S. Cl. 148—6.15 Z **24 Claims**

1. An acidic, aqueous coating solution for forming a zinc phosphate coating on a metal surface comprising about 0.08 to about 0.2 weight percent of zinc ion, about 0.8 to about 3 weight percent of phosphate ion, about 0.05 to about 0.35 weight percent of chlorate ion, about 0.001 to about 0.1 weight percent of nitrite ion, and a complex fluoride ion having the following concentration:

$$0.4 \geqq y \geqq 0.63x - 0.042$$

wherein x is the concentration of the zinc ion in weight percent and y is the concentration of the complex fluoride ion in weight percent.

4,311,536

PROCESSES OF PHOSPHATING SURFACES OF IRON AND OF STEEL WITH MANGANESE

Joseph Schapira, Paris; Victor Ken, Colombes; Jean C. Masson, Le Perreux, and Francois J. Duboys, Le Plessis Robinson, all of France, assignors to Compagnie Francaise de Produits Industriels, Gennevilliers, France

Filed Jul. 3, 1980, Ser. No. 165,763
Claims priority, application France, Jul. 6, 1979, 79 17687
Int. Cl.³ C23F *7/10*
U.S. Cl. 148—6.15 R **12 Claims**

1. A process for phosphatizing of metal surfaces of steel or iron with manganese which comprises the following successive processing steps:
contacting the metal surface with an aqueous alkaline degreasing bath having a pH from about 9 to 12 and comprising in suspension, a concentration of bivalent manganese in the form of orthophosphate greater than 0.5 g/l, said bivalent manganese orthophosphate having a particle size less than 100μ;
rinsing the metal surface;
contacting the metal with a phosphatizing bath; and
rinsing and drying the phosphatized metal surface.

4,311,537

LOW-COBALT FE-CR-CO PERMANENT MAGNET ALLOY PROCESSING

Gilbert Y. Chin, Berkeley Heights; Martin L. Green; Richard C. Sherwood, both of New Providence, and Jack H. Wernick, Madison, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 22, 1980, Ser. No. 142,633
Int. Cl.³ C21D *1/04*
U.S. Cl. 148—108 **8 Claims**

1. Method for producing a magnetic article comprising a body of an alloy which comprises Fe, Cr, and Co in a combined amount of at least 90 weight percent of said body, which comprises Cr in an amount in the range of 25–40 weight percent of said combined amount, which comprises Co in an amount in the range of 1–6 weight percent of said combined amount, in which weight percent Cr plus weight percent Co is greater than or equal to 31, and in which weight percent Cr plus three times weight Co is less than or equal to 43,
said method comprising solidifying a bulk object from a melt of said alloy, annealing, rapid cooling, and aging,
said method being CHARACTERIZED IN THAT aging

comprises lowering of temperature from a first temperature to a second temperature,

said first temperature being greater than a temperature which is 50 degrees C. less than a spinodal temperature,

said second temperature being less than or equal to 500 degrees C. and said second temperature further being such that magnetic properties are essentially fully enhanced upon lowering of temperature to said second temperature,

lowering of temperature being such that over essentially the entire range of temperatures between said first temperature and said second temperature, rate of temperature change is in a range of 0.1 to 1 degree C. per hour when weight percent Cr, here designated as x and weight percent Co, here designated as y, are such that $x+3y$ is less than 43, and in which said rate is in a range whose lower limit is $0.013x+0.04y-0.47$, and whose upper limit is $0.067x+0.2y-1.88$ when $x+3y$ is equal to 43,

said body being in a magnetic field which is sufficient to substantially magnetize said body for at least an initial period in which temperature is lowered,

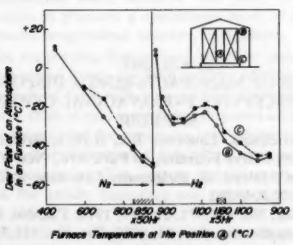
whereby said body has a coercive force which is greater than or equal to 150 oersted, a maximum energy product which is greater than or equal to 1 million gaussoersted, and an Alnico-5-normalized ratio of maximum magnetic energy product to unit weight Co comprised in said alloy which is greater than 3.

4,311,538

METHOD OF SEALING AN INNER COVER ARRANGED IN A BOX ANNEALING FURNACE USED FOR PRODUCING GRAIN-ORIENTED SILICON STEEL SHEETS

Nobuyuki Morito, Kobe, Japan, assignor to Kawasaki Steel Corporation, Kobe, Japan

Filed Jul. 7, 1980, Ser. No. 166,313
Claims priority, application Japan, Jul. 11, 1979, 54/87598
Int. Cl.³ H01F *1/04*
U.S. Cl. 148—112 **3 Claims**



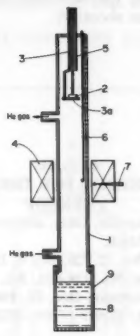
1. In a method of producing grain-oriented silicon steel sheets, said method being of the type including the steps of placing a decarburized steel sheet, prior to final annealing, in an inner cover arranged in a box annealing furnace, sealing the bottom edge of the inner cover and subjecting the decarburized steel sheet to a final annealing, carrying out a secondary recrystallization annealing and a purification annealing while forming at the same time, an electrically insulating film on the surface of the steel sheet, the improvement which comprises, prior to final annealing, sealing the lower end of the inner cover with coarse sand particles having an average size of 0.5–10 mm so as to effect a substantial reduction in the exfoliation of the insulating film formed at the final annealing on the surface of the steel sheet.

4,311,539

METHOD OF MANUFACTURING A HIGH PERMEABILITY AMORPHOUS MAGNETIC ALLOY

Satoru Uedaira; Shigeyasu Ito; Koichi Aso, and Masatoshi Hayakawa, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 28, 1980, Ser. No. 153,869
Claims priority, application Japan, Jun. 4, 1979, 54-69558
Int. Cl.³ H01F *1/00*
U.S. Cl. 148—121 **7 Claims**



1. A method of manufacturing a high permeability amorphous magnetic alloy comprising the steps of;

(a) preparing an amorphous magnetic alloy having a Curie temperature Tc(°K.) which is lower than its crystallization temperature Tcry (°K.), said alloy containing between 70 and 78 atomic % of Co, Fe, and Ni, and 22 to 30 atomic % of at least one of the glass forming elements Si, B, P, C, and Ge,

(b) keeping said alloy at a first temperature T_1 (°K.) satisfying the relation $0.95>Tc(°K.)\leqq T_1(°K.)<Tcry(°K.)$,

(c) quenching said alloy from said first temperature T_1 (°K.), and

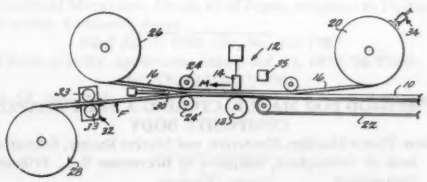
(d) annealing said alloy at a second temperature T_2 between 100° and 250° C. in the absence of an applied magnetic field.

4,311,540

ULTRASONIC BONDING PROCESS

Berlie R. Hill, Cana, Va., assignor to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 938,647, Aug. 31, 1978, Pat. No. 4,259,399. This application May 1, 1980, Ser. No. 145,833
Int. Cl.³ B32B *31/16*
U.S. Cl. 156—73.1 **37 Claims**



1. A method of forming a nonwoven fabric from a batt of random, loose ultrasonically fusible fibers utilizing an ultrasonic welding machine having a horn, anvil, and patterned surface means associated with the anvil, said method comprising the steps of:

progressively feeding in a given direction, the batt between

the horn and patterned surface means associated with the anvil of the machine;

forming the patterned surface means associated with the anvil so that raised portions of said patterned surface means are spaced a distance A in the dimension of feeding of the batt;

disposing said horn in operative relationship with said anvil patterned surface means so that said horn is substantially perpendicular to the direction of feeding of said batt; and

providing said horn with a horn face having an effective distance X along the dimension of feeding of the batt which is less than about 2A.

4,311,541

PANEL AND METHOD FOR THE PREPARATION THEREOF

Duane A. Fultz, Westeville, Ohio, assignor to The Dow Chemical Co., Midland, Mich.

Continuation of Ser. No. 72,726, Sep. 4, 1979, abandoned, which is a division of Ser. No. 928,482, Jul. 27, 1978, Pat. No. 4,233,361. This application Dec. 29, 1980, Ser. No. 220,550

Int. Cl.³ B29D *27/04;* **B32B** *5/20*

U.S. Cl. 156—78 **6 Claims**

1. A method for the manufacture of a composite synthetic resinous foam panel having at least first and second major generally parallel surfaces, the steps of the method comprising providing a mold, the mold when in the closed position having at least two major internal surfaces corresponding to the major surfaces of the panel disposed within the mold, disposing on the surfaces of the mold a foamable resole resin composition containing admixed therewith a particulate expanded inorganic glass, disposing within the open mold an expanded particulate synthetic resin mass in the form of a plurality of particles, the quantity of expanded synthetic resinous thermoplastic particles being about equal to or up to about twenty percent in excess of the volume of the mold, closing the mold to thereby sandwich the synthetic resinous thermoplastic particles between said two layers of foam forming resole resin composition and partially compressing the synthetic resinous thermoplastic particles, said particles having interstitial spaces therebetween, heating the foaming resole resin composition to a foam forming temperature, the resole resin composition being present in a quantity sufficient that on foaming the resole resinous composition permeates the interstitial spaces between the synthetic resinous particles, the resole resin curing and hardening to form an integral panel having a density of from about 1.5 to 5 pounds per cubic foot.

6. The method of claim 1 including the step of adhering an aluminum sheet to at least one major surface of the panel.

4,311,542

METHOD FOR MANUFACTURING A STRIP-SHAPED COMPOSITE BODY

Jean-Pierre Mueller, Hauterive, and Marius Raemy, Schmitten, both of Switzerland, assignors to Breveteam S.A., Fribourg, Switzerland

Filed Feb. 4, 1980, Ser. No. 118,093

Claims priority, application Switzerland, Feb. 7, 1979, 1195/79

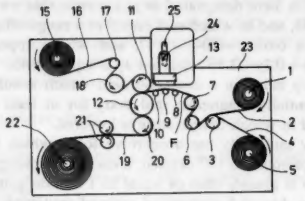
Int. Cl.³ B32B *31/26*

U.S. Cl. 156—84 **22 Claims**

1. A method of making a non-woven fabric comprising the steps of

guiding a perforated web of an at least mono-axially oriented heat-shrinkable thermoplastic material through a heating zone along a guide path continuously curved in one direction;

heating the perforated web in said heating zone to a thermoplastic condition to shrink the thermoplastic material and to form a net structure with opened perforations;



bringing at least one web of material into contact with the heated net structure, said web of material being substantially stable at the plastifying temperature of the perforated web;

feeding the contacting web of material and net structure to a pressure zone with the net structure in a thermoplastic condition; and

heat sealing the net structure to the web of material in said pressure zone while employing the heat of the net structure therefore.

4,311,543

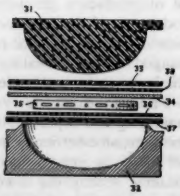
METHOD OF MANUFACTURING A DISPOSABLE CONTRACEPTIVE INTRAVAGINAL CERVICAL BARRIER

Robert L. Strickman, Lawrence Rd., R.D. 1, Bridgeton, N.J. 08302; Erick-Pierre Fournier, 30 Park Ave., New York, N.Y. 10016, and Melvyn B. Strickman, Lawrence Rd., R.D. 1, Bridgeton, N.J. 08302

Division of Ser. No. 924,971, Jul. 17, 1978, Pat. No. 4,198,965. This application Jan. 11, 1980, Ser. No. 111,266

Int. Cl.³ B32B *5/18;* **B29D** *27/04;* **A61F** *5/46*

U.S. Cl. 156—224 **12 Claims**



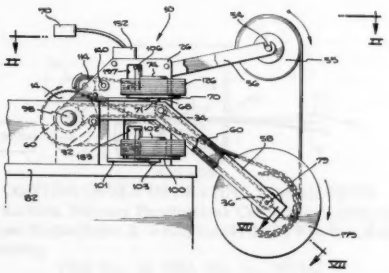
1. A method of manufacturing a disposable contraceptive intravaginal cervical barrier, which comprises

(a) assembling in sequence
a first sheet of foam plastic,
a plastic ring having the substantial shape of the circumference of said barrier,
a layer of medicated gel, and
a second flexible sheet,
said first and second sheets being made of thermoformable material,
(b) molding the assembly between a pair of heated dies for a sufficient time to form said assembly to the preselected shape of said dies, and
(c) sealing said assembly.

4,311,544
COMPONENT TAPING MACHINE

Albert Salopek, 23202 Sylvan St., Woodland Hills, Calif. 91406, and Joseph Emery, 2247 21st St., Santa Monica, Calif. 90405

Filed Mar. 10, 1980, Ser. No. 128,926
Int. Cl.³ B32B *31/10*
U.S. Cl. 156—510 **18 Claims**

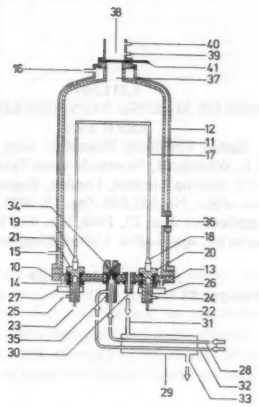


1. An apparatus for taping components having two generally aligned connection wires between two pairs of continuous adhesive strips to produce a continuous band of said components in spaced longitudinal relation, comprising:
means for supporting four rolls of adhesive tape;
adjustable wheel means for both guiding adhesive tape from a first pair of tape rolls into parallel alignment with the adhesive sides of said tapes being disposed away from said wheel means, and for receiving said connection wires of said components in spaced disposition upon said adhesive;
adjustable centering disc means, coaxial with said wheel means, for axially centering said components upon said wheel means;
adjustable roller means, pivotally biased towards said wheel means, for both guiding adhesive tape from the second pair of tape rolls into alignment with tape from said first pair of rolls in a manner whereby the adhesive sides of said tapes from said second pair of rolls is exposed to said adhesive side of said tapes from said first pair of rolls, and for pressing said tapes from said second pair of rolls against said tapes from said first pair of rolls, thereby pair-wise bonding said tape from said first and second pair of tape rolls to said connection wires to produce a continuous band of taped components in spaced longitudinal relation between tape from said first and said second pair of tape rolls; and
cutting means, disposed adjacent said wheel means, for removing the portions of said component wires extending outwardly past said bonded tape.

4,311,545
METHOD FOR THE DEPOSITION OF PURE SEMICONDUCTOR MATERIAL

Erwin Bugl, St. Radegund, Austria; Rudolf Griesshammer, Burghausen, Fed. Rep. of Germany; Helmut Lorenz, Burghausen, Fed. Rep. of Germany; Helmut Hamster, Burghausen, Fed. Rep. of Germany, and Franz Köppl, Altötting, Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Mar. 3, 1980, Ser. No. 126,768
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1979, 2912661
Int. Cl.³ C30B *25/08, 25/14*
U.S. Cl. 156—613 **4 Claims**

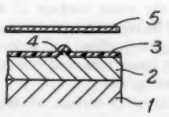


1. In a method for the deposition of pure semiconductor materials, especially silicon, by thermal decomposition of a decomposable compound of the semiconductor material on the surface of a heated carrier element, wherein the carrier element is heated to the decomposition temperature of the decomposable compound in a gas-tight, closed and coolable reactor, the improvement comprising:
said decomposable compound being at least partially fed into said reactor in a liquid state.

4,311,546
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

Sigeharu Abe; Hideo Tamura, both of Aizuwakamatsu, and Takayuki Murakami, Atsugi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 7, 1980, Ser. No. 166,170
Claims priority, application Japan, Jul. 11, 1979, 54-87669
Int. Cl.³ H01L *21/306*
U.S. Cl. 156—643 **5 Claims**



1. A method of manufacturing a semiconductor device, comprising the steps of

forming a layer on a semiconductor substrate by chemical vapor deposition technique,

forming a membrane of plastic material that resists etching on said layer,

pressing a flat plate against said plastic membrane on a projection of said layer to expose only said projection, and

etching said projection.

4,311,547

METHOD OF MAKING REINFORCED TUBULAR ARTICLES

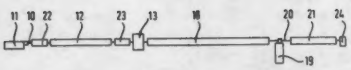
Ian Biggs, Sutton Coldfield; Ronald S. Goy, Tamworth, and Kenneth E. Whitehead, Newcastle-upon-Tyne, all of England, assignors to Dunlop Limited, London, England

Continuation of Ser. No. 942,038, Sep. 13, 1978, abandoned. This application Jun. 27, 1980, Ser. No. 163,588

Claims priority, application United Kingdom, Sep. 21, 1977, 39268/77

Int. Cl.[3] B29D *23/05*

U.S. Cl. 156—244.13 21 Claims



1. A method for the manufacture of a reinforced tubular article having an inner lining tube of vulcanised rubber comprising:

forming an inner tube of vulcanisable rubber composition,

applying to the outer surface of the inner tube an agent which will halogenate said surface, then passing said inner tube through a fluidised bed vulcaniser to effect vulcanisation of the inner tube and render said tube substantially self-supporting, and

forming on the outer surface of said inner tube an assembly of reinforcing members which are united with the inner tube by solidifiable liquid polymer material which when solidified bonds to both the reinforcing members and the outer surface of the inner tube.

4,311,548

Patent Not Issued For This Number

4,311,549

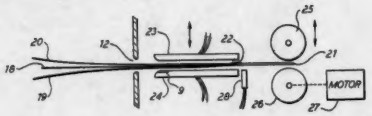
LAMINATOR WITH HEATING CONTROL SYSTEM

Alfredo J. Vercillo, Harwood Heights, Ill., assignor to General Binding Corporation, Northbrook, Ill.

Filed Aug. 11, 1980, Ser. No. 177,229

Int. Cl.[3] B30B *3/04, 15/34;* B32B *31/20*

U.S. Cl. 156—308.2 10 Claims



1. A method for laminating a packet formed of an article to be laminated positioned between top and bottom leaves having a heat reactivatible adhesive layer thereon, comprising the steps of:

providing a laminating machine having a heating zone with an electrical heating member;

providing means for pulling the packet through the heating zone and compressing the packet;

placing a lead edge of the packet in a ready position in the heating zone prior to applying electrical power to the heating member;

applying electrical power to the heating member without initiating movement of the packet through the heating zone;

when the heating zone attains a first temperature initiating movement of the packet through the heating zone;

while the packet is moving through the heating zone when a second temperature higher than the first and suitable for continuous laminating occurs controlling the power to the heating member so as to maintain the heating zone at the second temperature; and

after a trailing edge of the packet has approximately cleared the heating zone disconnecting power to the heating member to permit cooling thereof after completion of the laminating.

8. A system for laminating a packet formed of an article to be laminated positioned between top and bottom leaves having a heat reactivatible adhesive layer thereon, comprising:

a laminating machine having a heating zone with an electrical heating member, said laminating machine also having means for pulling the packet through the heating zone and means for compressing the packet for laminating;

means for aligning the packet in a ready position prior to applying electrical power to the heating member;

means for applying electrical power to the heating member when the packet is in the ready position without initiating movement of the packet through the heating zone;

means for activating the means for pulling to initiate movement of the packet through the heating zone when the heating zone attains a first temperature;

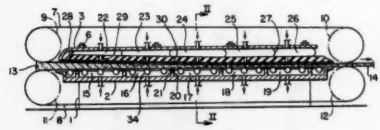
means for controlling power to the heating member while the packet is moving through the heating zone so as to maintain the heating zone at a second temperature substantially higher than the first suitable for continuous laminating; and

means for disconnecting power to the heating member when laminating of the packet has been completed.

4,311,550
CONTINUOUSLY OPERATING BOARD PRESS

Into Kerttula, Solymar Benalmadena Costa, Spain, assignor to Bison-Werke Bahre & Greten GmbH & Co. KG, Fed. Rep. of Germany

Filed Sep. 15, 1980, Ser. No. 187,143
Int. Cl.³ B30B *5/06, 15/34*
U.S. Cl. 156—555 **27 Claims**

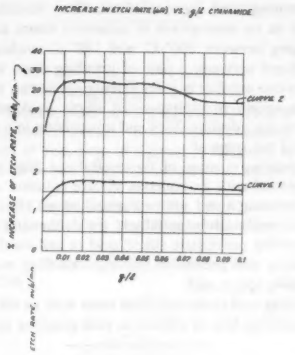


1. A continuously operating board press comprising an upper and lower continuously circulating endless press belt means for guiding board material to be pressed through the press, and means for exerting a pressure load on at least the upper press belt means and the board material, characterized in that the pressure load means includes at least one pressure chamber means having spaced lateral walls of an elastic material, weight plate means secured to a lower edge of the lateral walls for constantly applying a pressure on the upper pressure belt means, a gap is provided between the weight plate means and the upper press belt means, means are provided in the weight plate means for enabling a supplying of a pressure medium into the gap, and in that means are provided for sealing the gap.

4,311,551
COMPOSITION AND METHOD FOR ETCHING COPPER SUBSTRATES

Donald J. Sykes, Upper Saddle River, N.J., assignor to Philip A. Hunt Chemical Corp., Palisades Park, N.J.

Continuation-in-part of Ser. No. 29,218, Apr. 12, 1979, abandoned, which is a continuation-in-part of Ser. No. 914,392, Jun. 12, 1978, abandoned. This application Jul. 15, 1980, Ser. No. 169,146
Int. Cl.³ C23F *1/02;* **C03C** *15/00, 25/06;* **B44F** *1/22*
U.S. Cl. 156—640 **28 Claims**



1. An aqueous alkaline ammoniacal cupric etching spray bath containing an etch accelerating additive selected from the group consisting of cyanamide and its precursors, said etch accelerating additive being present in an amount sufficient to increase the etch rate of said bath by at least about 10 percent over an identical aqueous alkaline copper etching bath free of said additive.

2. A process of etching a copper-clad substrate having a portion of its surface masked with a resistant coating including the step of forcefully contacting both the masked and unmasked portions of said surface with a stream of an aqueous alkaline ammoniacal cupric etching solution containing an etch-accelerating-additive selected from the group consisting of cyanamide and its precursors, said etch-accelerating additive being present in an amount sufficient to increase the etch-rate of said bath by at least about 10 percent over an identical aqueous alkaline copper etching bath free of said additive and without substantially increasing the amount of undercut over the undercut obtained on a copper-clad substrate with an identical aqueous alkaline etching-bath free of said additive.

4,311,552
DEINKING OF NEWSPRINT

Albert Brucato, and Richard J. Brooks, both of Seattle, Wash., assignors to The Chemithon Corporation, Seattle, Wash.

Continuation of Ser. No. 13,220, Feb. 21, 1979, abandoned. This application Feb. 19, 1980, Ser. No. 122,281
Int. Cl.³ D21C *5/02*
U.S. Cl. 162—5 **8 Claims**

1. In a method for deinking cellulosic fibrous material impregnated with ink wherein a mixture of said material and water is stirred in the presence of a deinking agent, an improvement for increasing the brightness of the deinked material, said improvement comprising:

using as the deinking agent a deinking agent consisting essentially of a C_{15} to C_{20} alpha olefin sulfonate;

said mixture being at a temperature not substantially less than about 25° C. (77° F.).

4,311,553
METHOD FOR USE IN THE DEFIBRATION OR REFINING OF LIGNOCELLULOSE-CONTAINING FIBROUS MATERIALS

Sven G. Akerlund, Sollentuna, and Jan-Erik Höök, Lilla Edet, both of Sweden, assignors to Sunds Defibrator AB and Eka AB, both of Stockholm, Sweden

Filed Jan. 14, 1980, Ser. No. 111,624
Claims priority, application Sweden, Jan. 12, 1979, 7900302
Int. Cl.³ D21B *1/12*
U.S. Cl. 162—23 **6 Claims**

1. In the method of producing peroxide-bleached pulp from silicate impregnated lignocellulosic fiber material which is defibrated in an atmosphere of saturated steam at a temperature ranging between 100° C. and 170° C. within a grinding space defined between a pair of grinding discs which rotate relative to one another in a defibrating apparatus, the improvement preventing precipitation of silicic acid and insoluble silicates on the grinding discs and minimizing loss of peroxide, comprising the steps of

(a) preheating a mass of lignocellulosic fiber material impregnated with an aqueous silicate solution containing a sequestering agent with saturated steam at a temperature corresponding substantially to the defibrating temperature to thereby precipitate silicic acid in and on the fiber,

(b) passing said preheated impregnated fiber mass into said grinding space, and

(c) reacting said preheated fiber mass with an alkaline peroxide solution free of silicate in said grinding space

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4,311,554
INCOMBUSTIBLE MATERIAL

Alfons K. Herr, Stutensee, Fed. Rep. of Germany, assignor to KATAFLOX Patentverwaltungsgesellschaft mbH., Karlsruhe, Fed. Rep. of Germany

Filed Jul. 12, 1979, Ser. No. 57,266
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1978, 2831616
Int. Cl.³ D21H *3/74*
U.S. Cl. 162—159 **18 Claims**

1. Method for producing an incombustible material containing at least one mineral substance, said incombustible material comprising a first ingredient including a plurality of pieces comprising fibers of cellulose and/or chips of wood shavings; a mass of thermosetting synthetic resin gluing the pieces of said first ingredient together; and particles of calcium sulfate, boric acid and an at least partially glass or ceramic forming mineral adhering to said fibers and/or chips, said method comprising: (1) forming a mixture containing an at least partially glass or ceramic forming mineral, said step of forming including providing a quantity of the first ingredient having a water content up to about 80 percent by weight and intimately mixing that quantity of the first ingredient with boron minerals which react with sulfuric acid to form calcium sulfate and boric acid; (2) adding thereto, while continuing the mixing, concentrated sulfuric acid; (3) subjecting the resulting mixture to evaporation; and (4) subsequently combining the resulting product with resin and then bonding the product and resin into a solid body by applying pressure and heat to set the resin and obtain said incombustible material with the pieces of cellulose fibers and/or wood shaving chips being in the form of a network.

4,311,555
METHOD OF MANUFACTURING FIBERBOARD

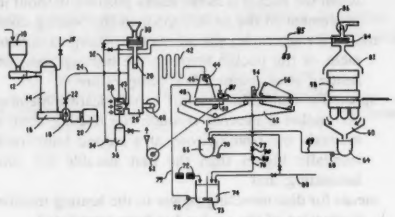
Rolf B. Reinhall, 834, 171 Place NE., Bellevue, Wash. 98008

Filed Sep. 26, 1977, Ser. No. 836,363
Claims priority, application Sweden, Oct. 6, 1976, 7611086
Int. Cl.³ D21C *3/24*
U.S. Cl. 162—206 **9 Claims**

1. The method of manufacturing fiberboard products according to the dry method from lignocellulosic moisture-containing fibers discharged from a defibrating apparatus, comprising the steps of:

(a) propelling the fibers in a stream of heated air to remove substantially all moisture therefrom, with consequent inactivation of the natural binders in the lignocellulosic fibers;

(b) depositing said dried fibers on an underlying moving screen to form a mat in which the fibers are oriented at random while removing propellent air therefrom;



(c) wetting said mat by adding water thereto while advancing it in its supported position on said screen without disturbing the random orientation of the fibers therein;

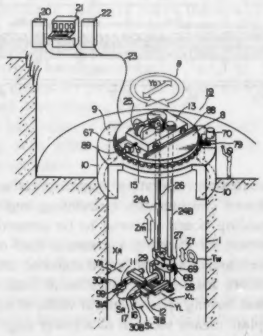
(d) advancing said mat further on said screen into a hot press to compress the wetted fibers and bond them together in their random orientation with consequent removal of water;

(e) the amount of water added at said wetting step being so coordinated to the dried fibers as to be effective by itself to bond the fibers in the hot pressing step without the addition of any extraneous bonding agent.

4,311,556
METHOD AND SYSTEM FOR INSPECTION OF INSIDE OF NUCLEAR REACTOR VESSEL

Taro Iwamoto; Shimon Ando; Sho Kusumoto; Tsutomu Omae; Toshitaka Suzuki, all of Hitachi; Masatake Takidera, Mito; Takaichi Koyama, Hitachi; Kunio Hamada, Mito, and Kazuhiro Yoshida, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 18, 1979, Ser. No. 58,431
Claims priority, application Japan, Jul. 27, 1978, 53-92018
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—249 **15 Claims**



1. A system for inspection of the inside of a nuclear reactor vessel comprising:

a support mounted on an upper portion of said nuclear reactor vessel;

a movable stage positioned for movement on said support;

column means supported by said movable stage and extended into said nuclear reactor vessel;
rise and fall means supported by said column means and arranged for movement in an axial direction of said nuclear reactor vessel;
a rotating shaft supported by said rise and fall means and extended in the radial direction of said nuclear reactor vessel;
first and second arm means supported by said rotating shaft and arranged for expansion and contraction substantially in both axial and radial directions of said rotating shaft independent of the movement of the rotating shaft or the rise and fall means;
means supported by said rise and fall means for rotating rotating shaft; and
inspecting means for inspecting a defect in said nuclear reactor, said inspecting means including a working unit mounted on the end of said first arm means, first monitor means mounted on the end of said second arm means for monitoring said working unit, second monitor means mounted on the end of said rotating shaft for monitoring a centering operation for aligning the axis of a nozzle in said nuclear reactor vessel with that of said rotating shaft and for monitoring said working unit, and third monitor means mounted on said movable stage for monitoring the movement of said first and second arms.

4,311,557

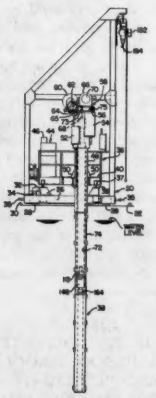
REFUELING MACHINE FOR A NUCLEAR REACTOR

Edward F. Kowalski, Glen Hazel; Kenneth J. Swidwa, Cheswick, and Leonard P. Hornak, North Huntington, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 12, 1979, Ser. No. 84,036

Int. Cl.³ G21C *19/20*

U.S. Cl. 376—271 **16 Claims**



1. A refueling machine for a nuclear reactor comprising:
a movable bridge arranged for back and forth movement spanning the containment walls of a nuclear reactor;
a trolley on said bridge movable in a direction transverse to bridge movement, the arrangement being such that the trolley is adapted to be positioned in the X–Y position over any one fuel assembly in a nuclear reactor after the reactor head has been removed;
a platform on said trolley for supporting a stationary mast housing and concentrically disposed inner and outer masts in said housing;
a hoist mechanism including a drive motor and a cable reel attached thereto surmounting said mast housing;
a lifting frame assembly connected at its upper end to a cable on said reel and at its lower end to the inner mast to thereby facilitate raising and lower of the inner mast;
actuation means on said inner mast, said actuation means including an actuation device connected to fuel assembly lifting fingers on the bottom end thereof;
a cam arrangement on said inner mast designed for coaction with said fingers as the fingers are moved vertically by the actuation means between fuel assembly latched and unlatched positions; and
means for lifting said fuel assembly from the reactor core.

4,311,558

PRESSURE VESSEL FOR A NUCLEAR POWER PLANT

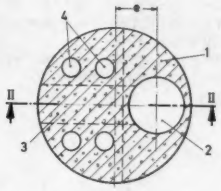
Hans-Georg Schwiers, Ketsch, and Josef Schoening, Hambruecken, both of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Cologne, Fed. Rep. of Germany

Filed Feb. 14, 1980, Ser. No. 121,576

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1979, 2908968

Int. Cl.³ G21C *19/28*

U.S. Cl. 376—296 **12 Claims**



1. A pressure vessel for a nuclear power plant comprising a generally cylindrical shaped first partial section, a cavity for housing a high temperature reactor within said first partial section, a second partial section forming the lower part of the pressure vessel, a horizontal tunnel for housing a gas turbine assembly within said second partial section and a plurality of recesses for housing components of a heat exchanger apparatus wherein said cavity for housing the high temperature reactor is eccentrically arranged with respect to said generally cylindrical shape in said first partial section of said pressure vessel.

4,311,559

HIGH TEMPERATURE GAS COOLED NUCLEAR REACTORS

Alan N. Knowles, Delamere, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Apr. 30, 1979, Ser. No. 34,277

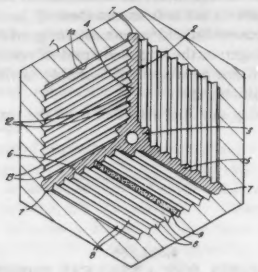
Claims priority, application United Kingdom, May 19, 1978, 20888/78

Int. Cl.³ G21C *3/20*

U.S. Cl. 376—432 **7 Claims**

1. A high temperature gas cooled nuclear reactor fuel element including a plurality of nuclear fuel-containing bodies and means for mounting said bodies for exposure to the nuclear reactor coolant, said bodies each comprising a flat sheet of carbonaceous matrix material, a multiplicity of fission product retaining coated fuel particles dispersed in said matrix material, and a thin layer of unfuelled graphite bonded to the exterior of

the surfaces of the flat sheet so as to enclose the sheet, said thin layer being formed from a plurality of separate carbonaceous



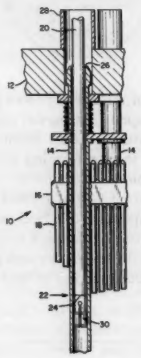
artefacts platen pressed on to said exterior surfaces whilst both it and the matrix material are in the green state.

4,311,560

STABILIZING DEVICE FOR CONTROL ROD TIP

Gary F. Verdone, Granby, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 4, 1979, Ser. No. 36,203
Int. Cl.³ G21C *7/10*
U.S. Cl. 376—225 **8 Claims**



1. A stabilizing device for a nuclear reactor control rod, the rod being adapted for telescoping movement within a guide tube having an upward flow of liquid coolant therethrough comprising:

a base section for rigidly connecting the upper end of the device to the lower end of the poison-bearing portion of the rod;

cantilevered spring means spaced about and extending longitudinally downward from the outer circumference of the base means to form an open-ended hollow inner region;

said cantilevered spring means having shoulders thereon for contacting the guide tube wall and providing an interference fit therebetween having substantially uniform radial forces distributed around the inner walls of the guide tube whereby the rod is centered within the guide tube and may longitudinally move in the tube; and

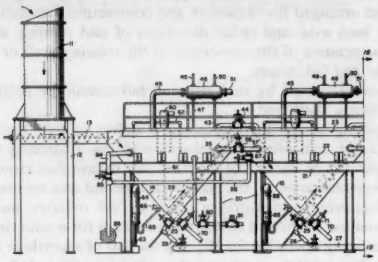
whereby at least some of the liquid coolant may bypass the shoulders through said hollow inner region.

4,311,561

APPARATUS FOR EXTRACTING BITUMEN FROM TAR SAND

Larry W. Hastings, Owensboro, Ky., assignor to Tarco Incorporated, Owensboro, Ky.

Filed Apr. 2, 1980, Ser. No. 136,748
Int. Cl.³ B01D *11/02;* C10B *1/18, 3/08*
U.S. Cl. 196—14.52 **5 Claims**



1. Apparatus for extracting bitumen from tar sand comprising a plurality of sealed extraction chambers in series including a first chamber, a last chamber and a washing chamber, means for charging said extraction chambers with a mixture of approximately one third tar sand and two thirds solvent, means for supplying tar sand to said first chamber, means for supplying solvent to said last chamber, means in each of said extraction chambers for moving tar sand and solvent from adjacent the bottom thereof to the top for discharge into the next adjacent extraction chamber, the movement of tar sand through said extraction chambers being in opposite direction to the flow of solvent through said extraction chambers, a common liquid level of a solution of bitumen and solvent in said extraction chambers, conduit means connecting adjacent ones of said extraction chambers at said liquid level, means for each of said extraction chambers for removing and condensing solvent vapor from above said liquid level for reuse of the condensed solvent, said washing chamber receiving sand and solvent from said last extraction chamber, means for supplying hot water to said washing chamber for removal of solvent from the sand as a vapor, means for condensing the solvent vapor from said washing chamber for reuse, conveyor means discharging clean sand from said washing chamber, means for removing a solution of solvent enriched in bitumen from adjacent the liquid level in said first extraction chamber, centrifugal means receiving the enriched solution and for separating a solution of solvent and bitumen from silt, means for separating the solvent from the silt as a vapor and means for condensing the last named solvent vapor for reuse in the apparatus.

4,311,562

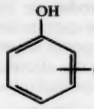
METHOD FOR INHIBITING DEPOSIT FORMATION IN PROCESS EQUIPMENT ASSOCIATED WITH SEPARATION AND PURIFICATION OF ALKYL PHOSPHOROCHLORIDOTHIOATES

Ellis B. Rifkin, Southfield, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Nov. 17, 1980, Ser. No. 207,770
Int. Cl.³ B01D *3/34;* C23F *11/00, 14/00*
U.S. Cl. 203—7 **21 Claims**

1. A method for inhibiting or preventing the accumulation of oxygenated phosphorus compound impurities in the distillation columns and column reboiler units associated with the separation and purification of O,O-dialkyl phosphorochloridothioates from a crude feed stock containing said O,O-dialkyl phosphorochloridothioates admixed with deposit-forming and fouling-causing oxygenated phosphorus compound impurities which comprises distilling said O,O-dialkyl phosphorochloridothioate containing feed stock in the presence of a minor proportion of the reaction product of:

A. one mole part of an alkylphenol having the formula:



wherein n is an integer from 1 to 2, and R_1 is an aliphatic hydrocarbon radical having a molecular weight of from about 400 to 1500;

B. from 1–5 mole parts of an aldehyde having the formula:

wherein R_2 is selected from hydrogen and alkyl radicals containing 1–6 carbon atoms; and

C. from 0.5–5 mole parts of an amine having at least one H—N< group.

4,311,563

PROCESS FOR THE ISOLATION OF MONOCHLOROACETALDEHYDE

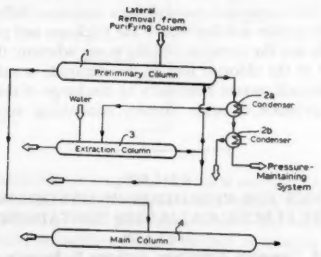
Werner Opavsky, Dumaguete City, Philippines; Josef Reisner, and Alois Maier, both of Cologne, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 31, 1981, Ser. No. 249,324

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1980, 3013817

Int. Cl.³ B01D *3/14*; C07C *47/14*

U.S. Cl. 203—46 **3 Claims**



1. A process for the isolation of chloroacetaldehyde, which is obtained as a by-product during the synthesis of acetaldehyde from ethylene and air in aqueous palladium chloride/cupric chloride solution by the 2-stage process, wherein crude chloroacetaldehyde is drawn from the acetaldehyde purification column and transferred to a disillation and extraction system, comprising the steps of:

(a) feeding crude chloroacetaldehyde to a distillation column and distilling the same to produce a head distillation product;

(b) fractionally condensing the head product to produce a chloroacetaldehyde-containing fraction;

(c) extracting the chloroacetaldehyde-containing fraction with water to produce an aqueous extract; and

(d) distilling said aqueous extract to produce chloroacetaldehyde.

4,311,564

DISTILLATION PROCESS AND APPARATUS FOR A BARGE-MOUNTED PLANT

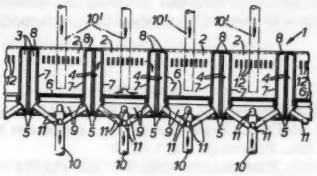
Dennis R. Aldridge, Bromley, England, assignor to Davy McKee (Oil & Chemicals) Limited, London, England

Filed Jun. 6, 1980, Ser. No. 157,244

Claims priority, application United Kingdom, Jun. 8, 1979, 20107/79

Int. Cl.³ B01D *3/20, 3/22*

U.S. Cl. 203—99 **19 Claims**



1. A distillation process which comprises:

providing a distillation tower having at least one distillation tray divided into a plurality of adjacent individual cup-like cavities, each cavity being adapted in use to receive a quantity of liquid and being defined by a substantially horizontally extending bottom portion provided with one or more apertures therein for upward passage of vapour therethrough and by peripheral wall means provided with at least one opening therethrough located at a pre-selected distance above the upper surface of the bottom portion thereby providing each said cavity with respective weir means at the periphery of said cavity and each cavity further being associated with respective downpipe means arranged to receive excess liquid overflowing the corresponding weir means from the cavity and to feed same to the tray below:

allowing liquid to flow into each cavity from the tray above so as to maintain a body of liquid therein;

passing vapour up the column through the aperture or apertures in the apertured bottom of each cavity into the body of liquid therein; and

allowing excess liquid to overflow from each cavity to a tray below.

2. A distillation column having two or more distillation trays at least one of which is provided with a plurality of cup-like cavities, each cavity being adapted in use to receive a quantity of liquid and being defined by a substantially horizontally extending bottom portion provided with one or more apertures therein for upward passage of vapour therethrough and by peripheral wall means provided with at least one opening therethrough located at a pre-selected distance above the upper surface of the bottom portion thereby providing each said cavity with respective weir means at the periphery of said cavity, and each cavity further being associated with respective downpipe means arranged to receive excess liquid overflowing the corresponding weir means from the cavity and to feed same to the tray below, whereby in use a body of liquid can be maintained in each cavity for contact with the upflowing vapour and for providing a liquid seal between stages despite tilting of the tray.

4,311,565

ELECTROCHEMICAL PROCESS FOR THE PRODUCTION OF BENZANTHRONE

Jacques Bersier, Riehen; Horst Jäger, Bettingen, and Hansrudolf Schwander, Riehen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed May 19, 1980, Ser. No. 151,482

Claims priority, application Switzerland, May 30, 1979, 5034/79

Int. Cl.[3] C07C *50/22;* C25B *3/04*

U.S. Cl. 204—73 R 8 Claims

1. An electrochemical process for the production of benzanthrone by reaction of anthraquinone, as starting material, with glycerol, which process comprises reducing anthraquinone, which may additionally contain electronegative substituents, to oxanthrone at the cathode in an electrolytic cell in acid medium, and simultaneously cyclising the reduced semiquinone form with glycerol to produce the corresponding benzanthrone.

4,311,566

ELECTROLYTE PERMEABLE DIAPHRAGM

Mary E. McCann, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 30, 1980, Ser. No. 173,774

Int. Cl.[3] C23B *1/34, 13/02, 13/08, 13/04*

U.S. Cl. 204—98 56 Claims

15. In a method of electrolyzing an alkali metal chloride brine chosen from the group consisting of potassium chloride and sodium chloride in an electrolytic cell having an anolyte compartment with an anode therein, a catholyte compartment with a cathode therein, and an electrolyte permeable diaphragm therebetween, which method comprises feeding the brine to the anolyte compartment, imposing an electrical potential across the cell whereby to evolve chlorine at the anode, imposing a hydrostatic head across the cell whereby to drive electrolyte from the anolyte compartment to the catholyte compartment, and recovering chlorine from the anolyte compartment and cell liquor containing alkali metal chloride and alkali metal hydroxide from the catholyte compartment, the improvement wherein the diaphragm is deposited on the cathode by the method comprising:

a. providing a slurry comprising a solvent, a pore forming component, a non-asbestos structural component, and a binder;

b. drawing the slurry through the foraminous structure whereby to deposit the pore forming component, the non-asbestos structural component, and the binder thereon;

c. forming a cohesive matrix of the non-asbestos structural component and the binder; and

d. removing the pore forming component.

4,311,567

TREATMENT OF PERMIONIC MEMBRANE

Preston S. White, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 17, 1980, Ser. No. 207,595

Int. Cl.[3] C20B *1/34;* C28B *13/08*

U.S. Cl. 204—98 4 Claims

1. In a method of operating an electrolytic cell having an anolyte compartment with an anode therein, a catholyte compartment with a cathode therein, and a cation selective permionic membrane therebetween, said cation selective permionic membrane comprising a polymeric perfluorocarbon having pendant functional groups, said functional groups being in the alkali metal salt form during electrolysis, which method comprises feeding alkali metal chloride brine to the anolyte compartment, passing an electrical current through the cell, and evolving chlorine at the anode, the improvement comprising:

(1) providing alkali metal chloride brine in the anolyte compartment, and an electrolyte in the catholyte compartment:

(2) maintaining an electrodialytic electrical potential between the anode and the cathode until the current density attains an electrolytic current density: and

(3) thereafter increasing the electrical potential therebetween whereby to initiate electrolysis.

4,311,568

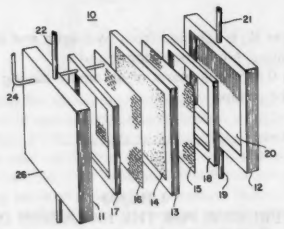
ANODE FOR REDUCING OXYGEN GENERATION IN THE ELECTROLYSIS OF HYDROGEN CHLORIDE

Edward N. Balko, Wilmington, Mass., assignor to General Electric Co., Wilmington, Mass.

Filed Apr. 2, 1980, Ser. No. 136,603

Int. Cl.[3] C25B *1/26, 9/00*

U.S. Cl. 204—128 17 Claims



1. A method for the electrolysis of hydrogen chloride in an electrolytic cell having a cation transporting solid polymer electrolyte membrane, a porous gas and liquid permeable catalytic anode having tortuous pores extending therethrough said anode being bonded to one surface of the solid polymer electrolyte membrane whereby hydrogen chloride and chloride ions diffuse through the pores toward the surface of the cation transporting membrane to be oxidized and form reaction products, and a cathode catalyst bonded to the other surface of the solid polymer electrolyte membrane, maximizing the transport rate of hydrogen chloride and chloride ions into said porous anode which comprises maintaining a minimum diffusion path within the anodes as a function of the thickness and porosity of the anode and the tortuosity of the pores whereby the rate of transport of the chloride ions to the electrode is sufficient to sustain the cell current essentially by discharge of the chloride ions to produce chlorine thereby minimizing co-evolution oxygen.

4,311,569

DEVICE FOR EVOLUTION OF OXYGEN WITH TERNARY ELECTROCATALYSTS CONTAINING VALVE METALS

Russell M. Dempsey, Hamilton; Anthony R. Fragala, N. Andover; Anthony B. La Conti, Lynnfield, and John F. Enos, Peabody, all of Mass., assignors to General Electric Company, Wilmington, Mass.

Filed Apr. 21, 1980, Ser. No. 142,589

Int. Cl.[3] C25B *1/10, 11/06, 11/10, 11/08*

U.S. Cl. 204—129 17 Claims

1. In a method for electrolytically generating oxygen, the steps comprising:

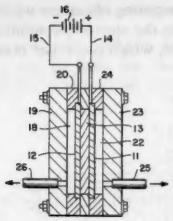
(a) providing a catalytic cathode;

(b) providing a catalytic oxygen evolving anode;

(c) positioning an ion exchange membrane between and in electrical contact with the cathode and the anode, the cathode and the anode being bonded thereto; and,

(d) providing a direct current potential between the cathode and the anode and supplying water to one of the electrodes to be acted on electrochemically to evolve oxygen at the anode,

the improvement comprising providing a catalyst at the oxygen evolving anode consisting of at least two platinum group



metal-containing compounds and at least one valve metal-containing compound exposed to the evolved oxygen.

4,311,570

CHEMICAL PROCESS ON THE SURFACE OF A ROTATING BODY

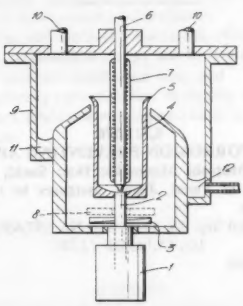
Geoffrey Cowen; Philip Norton-Berry, and Margaret L. Steel, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 21, 1979, Ser. No. 14,234

Claims priority, application United Kingdom, Feb. 21, 1978, 6806/78

Int. Cl.³ B01J *19/08, 19/12;* **C01B** *25/28;* **C07C** *147/06*

U.S. Cl. 204—157.1 R **9 Claims**



1. A process for carrying out a chemical reaction on at least one solid reactant, which comprises: continuously applying the solid reactant in a fluent particulate form to the surface of a rotating body, the surface being a surface of rotation coaxial with the axis of rotation of the body so that forces generated by the rotation of the body cause a film of the reactant to move across the surface from a supply zone to a discharge zone axially remote from the supply zone, heating the moving film of reactant until it melts, effecting the chemical reaction while the reactant moves across the surface as a molten film, regulating the rate of supply of the solid reactant and the speed of rotation of the body such that the product of the reaction is produced during movement of the reactant between the supply and discharge zones, and discharging the product from the surface of rotation at the discharge zone by using the centrifugal force of the rotating body to fling the product from the surface into the surrounding atmosphere.

6. A process as claimed in claim **1** wherein the surface of rotation and the film of the reactant medium thereupon are irradiated with radiant energy and chemical reaction induced thereby in the said film.

4,311,571

RAPID PHASE TRANSFORMATION FOR POLY(BUTENE-1)

Mark P. Mack, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Oct. 10, 1980, Ser. No. 195,822

The portion of the term of this patent subsequent to Feb. 5, 1997, has been disclaimed.

Int. Cl.³ C08F *6/00, 8/00*

U.S. Cl. 204—158 S **7 Claims**

1. A method for accelerating poly(butene-1) phase transformation from unstable tetragonal crystallites to stable hexagonal polymorph, the method comprising applying a material selected from the group consisting of olefinic hydrocarbons and alkyl halides to poly(butene-1) in type II (tetragonal) form, evaporating said material to cause an immediate phase change to type I (hexagonal) form in the area contacted, thereby accelerating phase transformation to a stable poly(butene-1) type I (hexagonal) form through the polybutene.

4,311,572

PROCESS FOR PREPARING SUBSTITUTED 2-IMINO-4-DIHALOMETHYLENE 1,3-DITHIOLANE COMPOUNDS WHICH ARE USEFUL AS HERBICIDAL ANTIDOTES

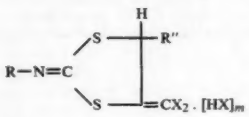
Frederic G. Bollinger, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 960,987, Nov. 15, 1978, Pat. No. 4,231,783. This application Nov. 3, 1980, Ser. No. 203,187

Int. Cl.³ B01J *19/08*

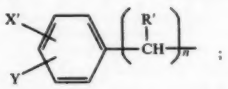
U.S. Cl. 204—158 R **8 Claims**

1. A process for preparing compounds of the formula



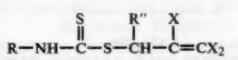
(I)

wherein X is chloro or bromo; R is hydrogen, C_{1-5} alkyl, or



; R′ is hydrogen or C_{1-5} alkyl; X′ and Y independently equal hydrogen, C_{1-5} alkyl, C_{1-5} alkoxy, chloro, bromo, fluoro or iodo; N is 1, 2 or 3; m is 0 or 1; R″ is hydrogen or C_{1-5} alkyl; which comprises the steps of:

(a) dissolving a compound having the formula



(II)

(wherein X, R and R″ are defined as in Formula I above) in an organic solvent which is non-reactive with the compound of Formula II and in which the compound of Formula II is soluble;

(b) exposing the mixture to an ultraviolet light source for a time sufficient to effect cyclization of the compound of Formula II to produce the compound of Formula I; wherein the reaction temperature is maintained at from 10° C. to 50° C. and wherein the reaction is carried out at atmospheric pressure.

4,311,573

PROCESS FOR GRAFT COPOLYMERIZATION OF A PRE-FORMED SUBSTRATE

Kenneth G. Mayhan; Robert A. Janssen, both of Irvine, and William J. Bertrand, Sunnymeade, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Oct. 8, 1980, Ser. No. 195,103

Int. Cl.³ C08F *2/10, 291/18, 291/06;* C08J *7/16*

U.S. Cl. 204—159.15 **18 Claims**

1. A process for producing a graft copolymer which comprises the graft polymerization of an ethylenically-unsaturated compound, in solution, with a substantially insoluble preformed solid or semi-solid polymeric substrate having peroxide groups, including hydroperoxide groups, along the polymer chains thereof, wherein the improvement comprises carrying out said polymerization in the presence of a variable valence metal ion in a reduced state capable of oxidizing to convert free hydroxyl radical to hydroxyl ion and thereby suppress homopolymerization of said monomer in said solution, said solution also containing squaric acid (diketocyclobutenediol and its ionized form) in a concentration sufficient to reduce said metal ion from its oxidized state and of complexing with said ion in its reduced state.

4,311,574

REGENERATION OF PHOTOGRAPHIC PROCESSING SOLUTIONS

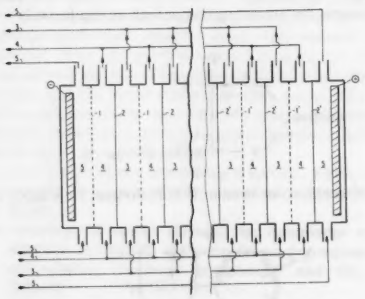
Takatoshi Ishikawa, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 27, 1980, Ser. No. 181,554

Claims priority, application Japan, Aug. 27, 1979, 54/109448

Int. Cl.³ B01D *13/02*

U.S. Cl. 204—180 P **2 Claims**



1. A method for regenerating a used photographic processing solution comprising bringing the used photographic processing solution into contact with a styrenedivinylbenzene copolymer having a pore radius of from about 300 A to 700 A, said copolymer having no electric charges, and then subjecting the used processing solution to ion exchange membrane electrophoresis.

4,311,575

METHOD FOR HIGH TEMPERATURE ELECTRODIALYSIS

Harumi Matsuzaki; Osamu Kuroda; Isao Okouchi, all of Hitachi; Kenkichi Izumi, Mito, and Sankichi Takahashi, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Babcock-Hitachi Kabushiki Kaisha, both of Tokyo, Japan

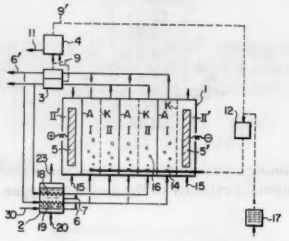
Filed Apr. 10, 1980, Ser. No. 138,975

Claims priority, application Japan, Apr. 18, 1979, 54-46640

Int. Cl.³ B01D *57/02*

U.S. Cl. 204—180 P **11 Claims**

1. An electodialytic process for desalting or concentrating an electrolyte solution in desalting chambers and concentrating chambers constituted by alternately juxtaposing a plurality of anion and cation exchange membranes between at least a pair of electrodes by supplying the electrolyte solution into the desalting and concentrating chambers while introducing a gas in a bubble state into the electrolyte solution between the ion exchange membranes, which comprises making the electrolyte



solution contact the gas in the bubble state while providing a temperature difference between the gas and the electrolyte solution making the gas to have a higher temperature than that of the electrolyte solution, and contacting the gas at the higher temperature with the electrolyte solution between the ion exchange membranes.

4,311,576

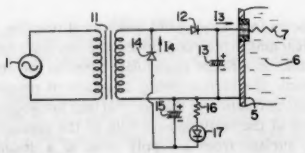
ELECTRIC CORROSION PREVENTING APPARATUS

Kenzi Toudo; Motoshi Miyanaka; Ikuo Saeki, and Yosiaki Nakaoka, all of Yanai, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 16, 1980, Ser. No. 187,630

Int. Cl.³ C23F *13/00*

U.S. Cl. 204—196 **2 Claims**

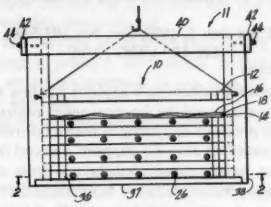


1. An electric corrosion preventing apparatus-circuit combination comprising; a receptacle for receiving liquid, an electrode adapted to contact said liquid as an anode, a lamp for indicating an operation state of said apparatus, a single transformer for transforming a commercial AC voltage to a low AC voltage, a first diode-capacitor combination for producing a first DC current from a positive part of said low AC voltage obtained by a secondary coil of said transformer, and a second diode-capacitor combination for producing a second DC current from a negative part of said low AC voltage, means connecting said receptacle as a cathode to said circuit, wherein said first and second DC currents are applied to said electrode and said lamp respectively.

4,311,577
METHOD FOR ASSEMBLING MEMBRANE ELECTROLYTIC CELLS

Morton S. Kircher, Clearwater, Fla., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 128,684, Mar. 10, 1980. This application Apr. 21, 1980, Ser. No. 142,204
Int. Cl.[3] C25B *15/00, 9/00*
U.S. Cl. 204—255 8 Claims



1. A method of assembling a monopolar filter press-type electrolytic cell, which method comprises the steps of:
(a) assembling a vertical stack of horizontal electrode frames with a horizontal membrane sheet between each pair of opposed frames;
(b) preconditioning said vertical stack by passing moist, warm fluid through said stack;
(c) applying pressure to opposite vertical ends of said stack so as to vertically compress said vertical stack;
(d) rotating said compressed vertical stack from a vertical orientation to a horizontal orientation;
(e) connecting said vertical assembled, rotated, horizontal stack into an electrical circuit and to raw material supply lines and product withdrawal lines; and
(f) electrolytically operating said vertically assembled horizontal stack while maintaining said stack in said horizontal orientation.

4,311,578
LIQUEFACTION PROCESS WHEREIN SOLVENTS DERIVED FROM THE MATERIAL LIQUEFIED AND CONTAINING INCREASED CONCENTRATIONS OF DONOR SPECIES ARE EMPLOYED

B. T. Fant, Kingwood; John D. Miller, Baytown, and D. F. Ryan, Friendswood, all of Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

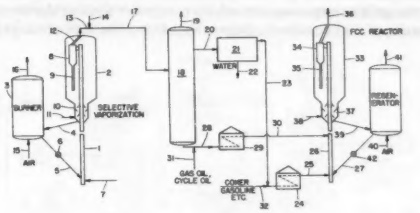
Filed Dec. 20, 1979, Ser. No. 105,798
Int. Cl.[3] C10G *1/00*
U.S. Cl. 208—8 LE 10 Claims

1. In a process for liquefying coal and similar solid carbonaceous materials wherein the solid carbonaceous material is slurried with a hydrogen donor solvent or a diluent distillate fraction derived from the solid carbonaceous material subjected to liquefaction and hydrogenated to increase the hydrogen donor species content thereof wherein the liquefaction is accomplished at elevated tempertures and pressures, the improvement which comprises extracting at least a portion of the naphthenic components from the hydrogenated solvent or diluent distillate fraction, converting at least a portion of the extracted naphthenic compounds to the corresponding hydroaromatic components and then combining at least a portion of these hydroaromatic components with the solvent or diluent distillate fraction.

4,311,579
PREPARATION OF FCC CHARGE BY SELECTIVE VAPORIZATION

David B. Bartholic, Watchung, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Continuation-in-part of Ser. No. 90,247, Nov. 1, 1979, Pat. No. 4,263,128, which is a continuation-in-part of Ser. No. 875,326, Feb. 6, 1978, abandoned. This application Jun. 2, 1980, Ser. No. 155,735
Int. Cl.[3] C10G *11/18, 9/18, 51/04*
U.S. Cl. 208—73 2 Claims



1. In a process for preparing premium products from crude petroleum by fractionally distilling the crude petroleum to separate gasoline and distillate gas oil from a residual fraction having a substantial Conradson Carbon number and charging the distillate gas oil to catalytic cracking, contacting said residual fraction in a rising confined vertical column with an inert solid material having a microactivity for catalytic cracking not substantially greater than 20 at low severity, including a temperature of at least about 900° F. for a period of time less than two seconds and less than that which induces substantial thermal cracking of said residual fraction, at the end of said period of time separating from said inert solid a decarbonized residual fraction of reduced Conradson Carbon number as compared with said residual fraction, reducing temperature of the said separated fraction to a level below that at which substantial thermal cracking takes place and adding said decarbonized residual fraction to said distillate gas oil as additional charge to said catalytic cracking; the improvement which comprises fractionating said reduced temperature separated fraction to provide a normally liquid naphtha fraction boiling below about 450° F. and a heavy fraction having a boiling range above that of said naphtha fraction, injecting said naphtha fraction to the bottom of a catalytic cracking riser reactor to produce a rising confined column of hydrocarbons in said reactor, injecting a finely divided active cracking catalyst to said reactor and dispersing the said catalyst in said rising confined column of hydrocarbons, injecting said heavy fraction to the rising confined column of catalyst dispersed in hydrocarbons at a point spaced above the injection of said naptha fraction and separating vaporous products of catalytic cracking from catalyst at the top of said riser reactor.

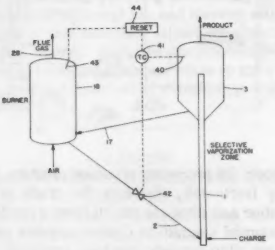
4,311,580
SELECTIVE VAPORIZATION PROCESS AND DYNAMIC CONTROL THEREOF

David B. Bartholic, Watchung, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Continuation-in-part of Ser. No. 90,247, Nov. 1, 1979, Pat. No. 4,263,128, and a continuation-in-part of Ser. No. 875,326, Feb. 6, 1978, abandoned. This application Apr. 28, 1980, Ser. No. 144,477
Int. Cl.[3] C10G *25/08*
U.S. Cl. 208—91 13 Claims

1. In a process for decarbonizing or demetallizing a hydrocarbon charge of whole crude or a residual fraction thereof by contacting said charge in a confined rising vertical column with a finely divided solid contact material consisting essentially of an inert solid material having a microactivity for

catalytic cracking not substantially greater than 20 at low severity, including a temperature of at least about 900° F. for a period of time less than about 3 seconds and less than that which induces substantial thermal cracking in said charge, at the end of said period of time separating a selectively vaporized major portion of said charge from said contact material bearing the unvaporized portion of the charge as deposit thereon, contacting said contact material bearing said deposit in a combustion zone with oxidizing gas to burn said deposit and generate heat whereby the temperature of said contact material is elevated by combustion of said unvaporized portion of the charge as fuel for the process, recycling the so heated contact material to renewed contact with said hydrocarbon charge, the improvement which comprises sensing the temperature of said confined column, regulating the rate of recycling



said so heated contact material responsive to the temperature so sensed to maintain said sensed confined column temperature at a predetermined value and dynamically controlling the system for the purpose of utilizing low hydrogen content, low value portions of said charge as said fuel for the process which dynamic control comprises adjusting said predetermined value of said sensed confined column temperature to about the minimum level at which said deposit provides the quantity of fuel which will, on combustion, maintain said combustion zone at a predetermined temperature; said adjustment being effected (a) by reducing said predetermined temperature of said rising confined column to provide more fuel in order to correct a trend toward lower temperature in said combustion zone or (b) by increasing said predetermined temperature of said rising confined column to provide less fuel in order to correct a trend toward higher temperature in said combustion zone.

4,311,581

PROCESS FOR REDUCING CO AND SO_x EMISSIONS FROM CATALYTIC CRACKING UNITS

Kenneth Baron, Diamond Bar, and Dennis P. McArthur, Yorba Linda, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Jan. 7, 1980, Ser. No. 109,756
Int. Cl.[3] C10G *11/08, 11/18*
U.S. Cl. 208—115 **15 Claims**

1. In a cyclical catalytic cracking process wherein cracking catalyst particles are continuously circulated through a catalytic cracking reaction zone and a regeneration zone, and a sulfur-containing hydrocarbon feedstock is fed to said catalytic cracking reaction zone and therein contacted at an elevated temperature with catalyst particles circulating therethrough, whereby said hydrocarbon feedstock is converted to product hydrocarbons while said catalyst particles become deactivated with sulfur-containing coke deposits, and said deactivated catalyst particles are then passed through said regeneration zone wherein said coke on said cracking catalyst particles is combusted, thereby reactivating the catalyst and producing a SO_x-containing flue gas, and said cracking catalyst particles are then recycled to said catalytic cracking reaction zone, the improvement comprising reducing the amount of SO_x compounds carried with said flue gas by introducing bastnaesite particles in with the catalyst particles continuously circulating through the catalytic cracking reaction and regeneration zones, said bastnaesite particles being particles of natural bastnaesite or a treated natural bastnaesite containing at least some of its original flourine.

4,311,582

STABILIZED REFORMING CATALYST

Marvin F. L. Johnson, and John A. Jaecker, both of Homewood, Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Oct. 2, 1980, Ser. No. 193,504
Int. Cl.[3] C10G *35/09*
U.S. Cl. 208—139 **6 Claims**

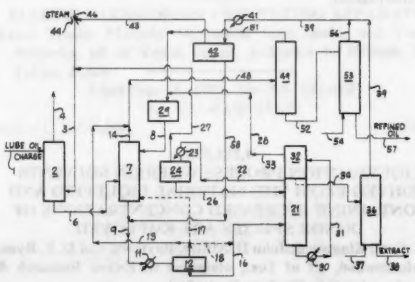
1. The process for reforming a naphtha fraction which comprises contacting the naphtha fraction under reforming conditions and in the presence of hydrogen with a reforming catalyst comprising a modified alumina support, derived from an alumina precursor, having distributed thereon from about 0.3 to about 1.0 weight percent platinum, from about 0.3 to about 1.0 weight percent rhenium, and from about 0.5 to about 2.0 weight percent chloride, wherein the modified alumina support precursor comprises at least about 75 weight percent boehmite, having an average crystallite diameter no greater than about 60 Angstroms, and the modified alumina support additionally comprises from about 0.25 to about 5.0 weight percent silica, the silica having been added to the boehmite-containing alumina as an aqueous solution of an alkali-metal silicate, followed by washing to remove the alkali metal.

4,311,583

SOLVENT EXTRACTION PROCESS

Robert A. Woodle, Nederland, Tex., assignor to Texaco, Inc., White Plains, N.Y.

Filed Feb. 27, 1980, Ser. No. 125,034
Int. Cl.[3] C10G *21/20*
U.S. Cl. 208—312 **9 Claims**



1. In a process for solvent refining a lubricating oil feedstock wherein said lubricating oil feedstock is contacted with N-methyl-2-pyrrolidone as a selective solvent for aromatic constituents of said feedstock in an extraction zone thereby forming a raffinate phase comprising a minor amount of said solvent and an extract phase comprising a major amount of said solvent, said raffinate phase is separated from said extract phase and solvent is removed from each of said phases, the improvement which comprises cooling said extract phase to a temperature below the temperature in said extraction zone by an amount sufficient to form two immiscible liquid phases comprising a secondary extract phase richer in aromatic hydrocarbons than said primary extract and a secondary raffinate phase poorer in aromatic hydrocarbons than said primary extract, and combining said primary raffinate with said secondary raffinate prior to the separation of solvent therefrom.

4,311,584
AMINE FLOTATION OF CHROMITE FROM ACIDIC PULPS

Gregory E. Smith, Salt Lake City; Jerry L. Huiatt, Murray, and Monte B. Shirts, S. Jordan, all of Utah, assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Nov. 12, 1980, Ser. No. 206,246
Int. Cl.³ B03D *1/02*; B03B *7/00*
U.S. Cl. 209—12 **5 Claims**

1. A method for recovering chromite from pulverized low-grade chromite ore having a particle size not finer than 30 microns, consisting essentially of:

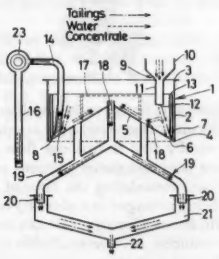
agitating and aerating an aqueous pulp of said chromite ore containing a primary coco-amine collector, said pulp having an acidity adjusted to less than 2.5 by means of sulfuric acid; and

recovering a chromite-containing froth as a concenrate.

4,311,585
CLASSIFICATION OF PARTICULATE MATERIAL

Otto T. Bergstrom, Wilropark, South Africa, assignor to Egberg Patents (Pty.) Limited, Johannesburg, South Africa

Filed Feb. 19, 1980, Ser. No. 122,491
Claims priority, application South Africa, Feb. 19, 1979, 79/770; Apr. 25, 1979, 79/2052; Dec. 6, 1979, 79/6692
Int. Cl.³ B03B *5/58, 5/62*
U.S. Cl. 209—211 **11 Claims**



1. An apparatus for separating particles having a specific gravity above a predetermined value in a fluid suspension from particles having a specific gravity below a predetermined value in the fluid suspension comprising:

a cylindrical vessel rotatable about its axis;

a feed inlet for introducing particulate material suspended in a fluid into the vessel;

a concentrate outlet for particles having a specific gravity above the predetermined value; and

means for preventing particles from packing together at the cylindrical wall of the vessel during rotation thereof at speeds in excess of the critical speeds of the particles having a specific gravity above the predetermined value.

4,311,586
SOLVENT MIXING IN HPLC USING LOW PRESSURE SOLVENT METERING PUMPS

Lawrence G. Baldwin, Smithville; Burney J. Ehrlich, Austin, and Jack B. Dixon, Georgetown, all of Tex., assignors to Tracor, Inc., Austin, Tex.

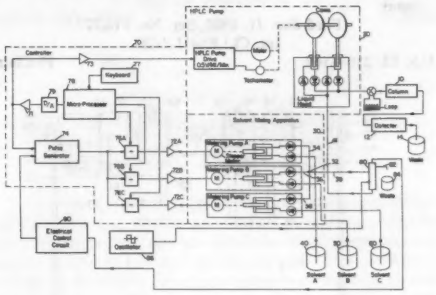
Filed Apr. 22, 1980, Ser. No. 142,679
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—101 **5 Claims**

1. In a liquid chromatograph having solvent mixing apparatus producing a solvent mixture, a controller operative to regulate the total flow rate of the solvent mixture produced by the solvent mixing apparatus, a column, and a solvent mixture flow path defined between the solvent mixing apparatus and the column, the improvement comprising:

a sensing detector cell disposed in the solvent mixture flow path between the solvent mixing apparatus and the column;

the cell having an inlet port for receiving an input flow of solvent mixture into the cell from the solvent mixing apparatus, an outlet port for withdrawal of an output flow of solvent mixture for introduction to the column, and a reservoir between the inlet and outlet ports for holding a volume of solvent mixture accumulated in an amount dependent upon the relative flow rates of the cell input flow and the cell output flow;

the cell having first and second spaced-apart electrodes, one of the electrodes being provided to receive an applied



electrical excitation and the other electrode being provided to sense the applied excitation through an accumulated volume of solvent mixture between the electrodes and produce an excitation response signal functionally related to the volume of the accumulated solvent mixture; and

an electrical control circuit responsive to the sensing detector cell excitation response signal and coupled to the solvent mixture flow rate controller for effecting a reduction in the total flow rate of the produced solvent mixture when the volume of the accumulated solvent mixture in the cell exceeds a preset amount and for effecting an increase in the total flow rate of the produced solvent mixture when the volume of the solvent mixture accumulated in the cell becomes less than the preset amount.

4,311,587
FILTER ARRANGEMENT DENYING BACTERIA ENTRY TO PERITONEUM

Yukihiko Nose, Cleveland Heights, and Paul S. Malchesky, Painesville Township, Lake County, both of Ohio, assignors to Japan Foundation for Artificial Organs, Cleveland, Ohio

Filed Dec. 10, 1979, Ser. No. 102,140
Int. Cl.³ A61M *5/00*; B01D *31/00*
U.S. Cl. 210—136 **3 Claims**

1. A filter connection for peritoneal dialysis comprising a sub-micron bacteria filter for removing sub-micron particles between about greater than 0.2 μm size, means to connect a

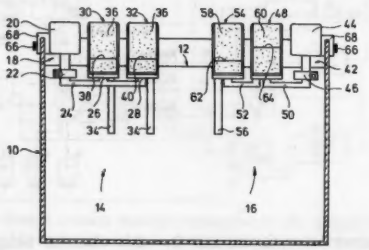
pressurized source of fresh dialysate solution carried by the wearer to the upstream end of said filter, a tubular connection at the downstream end of said filter, a coacting first check valve in said tubular connection permitting flow only away from said filter, an outflow port communicating with said tubular connection downstream from said first check valve and independent of said filter, there being the equivalent of a second check valve in communication with said outflow port permitting flow only away from said port, and means for attaching to said tubular connection a catheter tube communicating with the peritoneum of a patient.

4,311,588

FILTER FOR USE WITH AN AQUARIUM

Norbert Tunze, Wankstr. 39, 8122 Penzberg, Fed. Rep. of Germany

Filed Jan. 21, 1980, Ser. No. 113,727
Int. Cl.³ E04H *3/20*
U.S. Cl. 210—169 **16 Claims**



1. A pump and filter combination for an aquarium comprising motor means for operating a pump impeller, mounting means for supporting said motor means on the sidewall of an aquarium, shaft means depending vertically beneath said motor means and constructed and arranged to rotate a pump impeller located beneath said motor means, housing means for said impeller and an outlet for liquid in said impeller housing, bracket means with a conduit located therein, said conduit being in fluid communication with the suction side of said impeller housing at one end thereof and communicating with the interior of a filter housing at the other end thereof, said filter housing comprising a base supported by said bracket and of a cup-shaped upper portion having a closed upper end that is vertically removable from said base, inlet and outlet connecting means depending from the lower side of said filter housing and being in communication with the interior thereof, filter means located in said filter housing between said inlet and outlet filter housing connecting means located on said base, whereby when a filter has become clogged to the point where servicing or replacement is necessary, change can be easily effected by merely grasping the closed upper end portion of said filter housing and easily disengage said filter housing from said bracket means.

4,311,589

TOROIDAL FLOW BLOOD REACTOR

Robert C. Brumfield, Incline Village, Nev., assignor to Biomedics, Inc., Arlington Heights, Ill.

Filed Nov. 6, 1979, Ser. No. 92,053
Int. Cl.³ B01D *17/00*; B01N *43/00*
U.S. Cl. 210—177 **5 Claims**

1. A core assembly for a reactor suitable for extracorporeal treatment of blood, and comprising:

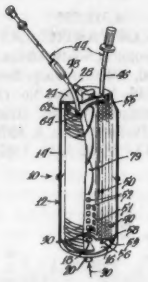
a conduit defining within itself a passage of generally circular cross section for conducting an introduced fluid in a generally first in-first out flow sequence, said conduit being wound about a longitudinal axis in a plurality of concentric helices generating a centrifugally-induced, transverse double torodial secondary fluid flow within said passage to effect radial mass transport therewithin and mixing between the center and the periphery of said passage; and

spacer means at least radially separating adjacent helices for permitting circulation of a heat transfer fluid around said conduit in each helix;

said spacer means including a ridge member extending in a spiral locus about said conduit.

5. A linear reactor for effecting first in-first out, in-line flow sequence for a first fluid stream and for effecting a thermal energy exchange between said first fluid stream and a second fluid stream to attain and maintain a predetermined first fluid temperature, such as in the extracorporeal treatment of blood, said reactor comprising:

a tank means for circulating said second fluid and having an inlet for said second fluid and an outlet for said second fluid;



a convoluted conduit defining within itself a passage having a generally circular cross section for conducting said first fluid in a generally first in-first out flow sequence, said conduit having inlet and outlet portions passing through said tank for accommodating the flow of said first fluid, said conduit being arranged in a plurality of helices generally concentric about a longitudinal axis and generating a centrifugally-induced, transverse double toroidal secondary flow within said passage;

spacer means at least radially separating adjacent helices for permitting circulation of said second fluid around said conduit in each said helix to promote heat transfer between said first and second fluids; and

a baffle means disposed interior of said conduit helices for deflecting a portion of said second fluid flow entering said shell through said inlet away from said longitudinal axis and through said conduit helices.

4,311,590

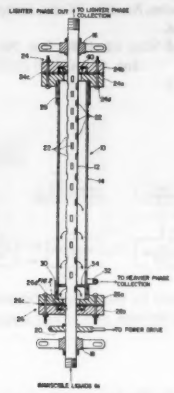
PHASE SEPARATION APPARATUS

Henry P. Sheng, 3316 Woodbend Dr., Claremont, Calif. 91711

Filed Sep. 25, 1980, Ser. No. 190,759
Int. Cl.³ B01D *33/06*
U.S. Cl. 210—360.2 **5 Claims**

1. A phase separation apparatus for providing phase separation of two immiscible liquids of heavier and lighter phases, said apparatus comprising an inner vertically extending rotatable tube including an inlet at the bottom thereof for receiving the two immiscible liquids and a plurality of openings along the length thereof, said openings being more closely spaced together at the top of the inner tube than at the bottom thereof, a fixed outer tube surrounding the inner vertically extending tube and forming an outer chamber therewith, said outer tube being mounted in a pair of flange assemblies each including a resilient gasket captured between a pair of flange members, means for rotating the inner tube, when the liquids are axially charged into the bottom inlet of said inner tube, such that the heavier phase is separated from the lighter phase and exits

through said openings in said inner tube into said outer chamber, means for collecting the lighter phase from the top of the



inner tube and means for collecting the heavier phase from said outer chamber.

4,311,591

FILTER FOR SEPARATING SOLID BODIES FROM A FLUID STREAM

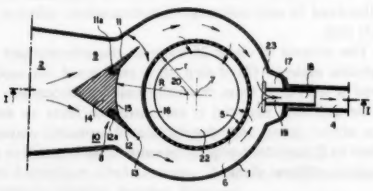
Klaüs Eimer; Heinz Thal, both of Ratingen, and Dieter Mindel, Duisburg, all of Fed. Rep. of Germany, assignors to Ludwig Taprogge Reinigungsanlagen für Röhren-Wärmeaustauscher, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 11, 1980, Ser. No. 168,753

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1979, 2928093

Int. Cl.³ B01D *35/22*

U.S. Cl. 210—405 **14 Claims**



1. A filter for separating solid bodies from a fluid stream, comprising:

a substantially cylindrical separator housing having a pair of end walls and a cylindrical wall with a first axis of symmetry;

an inlet conduit connected to said cylindrical wall and oriented substantially radially to said housing;

a first outlet conduit connected to an end of said housing for channeling filtered fluid therefrom;

a second outlet conduit connected to said cylindrical wall opposite said inlet conduit and oriented substantially parallel thereto for channeling from said housing solid contaminants separated by said filter from a fluid stream fed thereto via said inlet conduit;

a filter sieve disposed in said housing to form an inner chamber communicating with said first outlet conduit and an outer chamber between said cylindrical wall and said sieve communicating at one end with said inlet conduit and at an opposite end with said second outlet conduit, said sieve having a second axis of symmetry extending parallel to said first axis;

channeling means for dividing said fluid stream into two substantially equal portions;

gating means disposed in said housing at said inlet conduit for regulating fluid flow into said outer chamber, said gating means including a pair of independently actuatable flaps hingedly mounted in said housing for pivoting about respective rotation axes parallel to said first and said second axis; and

actuating means for pivoting said flaps.

4,311,592

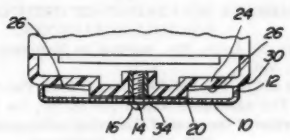
FILTER SCREEN FOR WHIRLPOOL APPARATUS

David S. Brown, 3957 W. Lawrence Ave., Chicago, Ill. 60625

Filed Nov. 4, 1980, Ser. No. 203,897

Int. Cl.³ B01D *35/02*

U.S. Cl. 210—416.2 **2 Claims**



1. In a whirlpool bath apparatus to be placed interiorly of a bathtub of water, having an impeller in said apparatus for drawing water from the tub interiorly of said apparatus and having a bottom wall and an integral axial offset portion extending downwardly from the bottom wall forming an axial hub through which water is drawn interiorly of said apparatus and the apparatus having an outlet, in combination with a thin, wafer-like, circular filter screen bearing against substantially the entire bottom wall and hub and to be removably secured to said hub, an upwardly extending integral peripheral flange on the periphery of said filter screen with the free end bearing against said bottom wall.

4,311,593

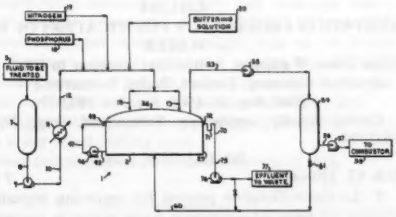
PROCESS FOR TREATMENT OF WASTE WATER

Henry H. Benjes, Overland Park; Valery N. Wahbeh, Leawood, and John R. Stukenberg, Overland Park, all of Kans., assignors to Bacardi Corporation, San Juan, P.R.

Filed Sep. 15, 1980, Ser. No. 187,551

Int. Cl.³ C02F *3/28*

U.S. Cl. 210—603 **8 Claims**



1. A process for reducing oxygen demanding material in a fluid in an influent stream of waste water and producing methane; said process comprising the steps of:

(a) distributing said fluid within an upper portion of an anaerobic digester containing methane producing microorganisms in a high surface area media;

(b) flowing said distributed fluid downwardly through said media to a lower portion of said digester;

(c) generally continuously recirculating a substantial portion of said downwardly flowing stream after passing through said media from said lower portion of said digester directly to said upper portion of said digester such that from

approximately one to ten times the amount of the influent stream is recirculated from said lower portion to said upper portion of said digester;

(d) withdrawing an effluent stream of a portion of the fluid from within said digester after said effluent stream has been substantially acted upon by said microorganisms so as to reduce the oxygen demanding material therein with respect to said influent stream and so as to produce methane within said digester; and

(e) removing a portion of the methane produced in said digester therefrom.

4,311,594

MEMBRANE SEPARATION OF ORGANICS FROM AQUEOUS SOLUTIONS

Eli Perry, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 636,400, Dec. 1, 1975, Pat. No. 4,218,312. This application Aug. 27, 1979, Ser. No. 69,957

The portion of the term of this patent subsequent to Aug. 19, 1997, has been disclaimed.

Int. Cl.³ B01D *13/00*

U.S. Cl. 210—640 **9 Claims**

1. A process for separating neutral organics from an aqueous solution which comprises contacting an aqueous solution containing neutral organics having at least four carbon atoms per molecule selected from alkanols, organic nitriles and alkyl benzenes with a first surface of a hydrophobic polymeric membrane selected from polysilicones and polyurethanes selectively permeable to the neutral organic components contained in the aqueous solution; maintaining a second and opposite membrane surface at a lower chemical potential than the first membrane surface for the neutral organic components; permeating a portion of said neutral organic components into and through the membrane; and withdrawing at the second membrane surface a mixture having a higher total concentration of the neutral organic components than the total concentration of said neutral organic components in the aqueous solution contacting said first surface.

4,311,595

FLOTATION PROCESS FOR PURIFICATION OF WASTE WATER

Elias Jülke, Wettingen, Switzerland, assignor to BBC, Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Aug. 25, 1980, Ser. No. 180,977

Claims priority, application Switzerland, Aug. 29, 1979, 7822/79

Int. Cl.³ C02F *1/24*

U.S. Cl. 210—671 **7 Claims**

1. An electroflotation process for removing impurities including oil from oil-containing waste water in contact with electrode surfaces and for inhibiting formation of an oil film on said surfaces, wherein said waste water is electrolyzed, whereby an ascending stream of gas bubbles is produced and said electrolysis takes place in the presence of wettable particles of a polymeric material which is practically insoluble in water and has an absolute density no greater than 1.3 g/dm², said wettable particles being entrained in said ascending steam of bubbles to rise to the surface of said waste water along with said impurities, removing said particles including oil from the surface of the waste water and reintroducing them into the waste water to be treated after being cleaned of at least a portion of the associated impurities including oil.

4,311,596

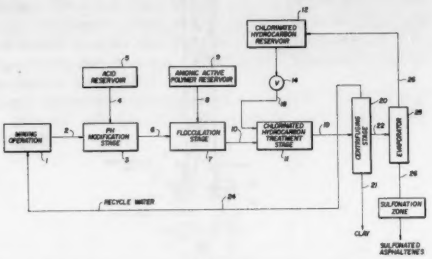
EXTRACTION OF REUSABLE WATER FROM A MINERAL MINING PROCESS

William K. T. Gleim, Seattle, Wash., assignor to Energy Modification Inc., Fla.

Filed May 14, 1980, Ser. No. 149,731

Int. Cl.³ C02F *1/54*

U.S. Cl. 210—711 **30 Claims**



25. A process for the treatment of an aqueous effluent slime derived from a tar sands extraction process comprising water, asphaltic material and clay which comprises:

(a) reducing the pH of said effluent slime to a pH of about 2 to about 6 by the addition of an acidic compound thereto;

(b) treating said effluent slime of reduced pH with about 0.001 to about 1 weight % of an anionic surface active agent to create flocculation of solid asphaltic material entrained within said slime;

(c) treating said flocculated effluent slime with 5 to 10 weight % of chlorinated hydrocarbon and a solvent therefor comprising an aromatic compound selected from the group consisting of benzene, toluene, xylenes or mixtures thereof; and,

(d) centrifuging said treated effluent slime to produce three physical layers of material which comprise: (1) a top layer of water; (2) an intermediate layer of asphaltic material dissolved in said chlorinated hydrocarbon solution; and, (3) clay.

30. The process of claim 25 wherein the intermediate layer of asphaltic material (2) of step (d) is recovered; the asphaltic material is separated from the chlorinated hydrocarbon solution; the asphaltic material is sulfonated to form an anionic surface active agent; and, the sulfonated asphaltic material is returned to flocculation step (b) as anionic surface active agent for treating effluent slime.

4,311,597

METHOD AND APPARATUS FOR TREATMENT OF WASTEWATER

Aniruddha Bhattacharyya, West Seneca, N.Y., assignor to Republic Steel Corporation, Cleveland, Ohio and The Hanna Furnace Corporation, Buffalo, N.Y.

Filed Feb. 21, 1979, Ser. No. 13,679

The portion of the term of this patent subsequent to Jun. 2, 1998, has been disclaimed.

Int. Cl.³ C02F *3/12*; B01D *3/38*; C02F *1/10*

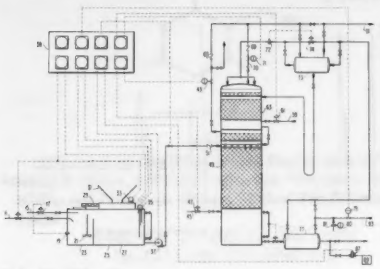
U.S. Cl. 210—731 **26 Claims**

1. A method for removing ammonia from a wastewater containing free and fixed ammonia said process comprising the steps of:

(a) distilling said wastewater to remove said free ammonia;

(b) treating said wastewater of step (a) by adding an 18–22%

aqueous soda ash solution thereto to decompose said fixed ammonia; and



(c) distilling said treated wastewater of step
(b) in a packed column to remove said fixed ammonia.

4,311,598

DISINFECTION OF AQUEOUS MEDIA

Hubert Verachtert, Oud-Heverlee, Belgium, assignor to Interox Chemicals Limited, London, England

Filed Aug. 1, 1980, Ser. No. 174,631

Claims priority, application United Kingdom, Sep. 4, 1979, 30588/79

Int. Cl.[3] C02F *1/70, 1/50*

U.S. Cl. 210—757 9 Claims

1. In a process for the disinfection of a bacteria-containing aqueous medium wherein hydrogen peroxide is introduced and the pH of the aqueous medium maintained at from pH 6 to 9, for subsequent discharge into water courses or inland waters, the improvement comprising the provision of hydrogen peroxide or peroxyacid in a concentration selected in the range of from 2.5×10^{-6} M to 3×10^{-3} M, together with a soluble copper salt in a concentration in the range of from 3×10^{-6} M to 2×10^{-5} M and an autoxidisable reducing agent in a concentration in the range of from 1×10^{-6} M to 3×10^{-5} M the concentrations of copper and reducing agent being so selected in combination that the mole ratio of copper to autoxidisable reducing agent is in the range of from 15:1 to 1:2.5 and the mole ratio of hydrogen peroxide to copper is in the range of from 1:1 to 60:1 or peroxyacid to copper is in the range of from 5:1 to 1:5.

4,311,599

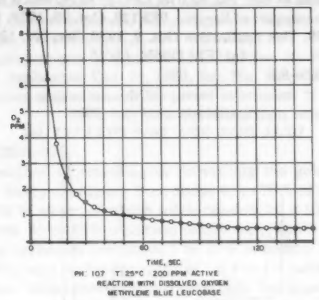
REDUCED METHYLENE BLUE FOR OXYGEN REMOVAL

Manuel Slovinsky, Woodridge, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 12, 1980, Ser. No. 206,320

Int. Cl.[3] C02F *1/58;* C23F *11/04*

U.S. Cl. 210—757 1 Claim



1. An improved method for scavenging dissolved oxygen from alkaline waters which consisting essentially of treating said waters with at least 10 ppm of methylene blue in its reduced or leuco base form.

4,311,600

HUMATE THINNERS FOR DRILLING FLUIDS

William C. Firth, Jr., Robbinsville, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Continuation-in-part of Ser. No. 894,026, Apr. 6, 1978, Pat. No. 4,235,727. This application Nov. 24, 1980, Ser. No. 209,498

The portion of the term of this patent subsequent to Nov. 25, 1997, has been disclaimed.

Int. Cl.[3] C09K *7/02*

U.S. Cl. 252—8.5 C 3 Claims

1. A method of reducing the viscosity of a water-based drilling mud, which comprises;

providing a quantity of humate, said humate having been associated with titanium mineral deposits and having a compositional make-up of carbon and hydrogen with a ratio (weight to weight) of 9.5–17.5:1.0; oxygen with carbon to oxygen (weight to weight) ratio of 1.0–2.3:1.0; an aluminum content of 2.8–8.4 percent by weight; a titanium content of 0.5–3.5 percent by weight and a calcium content of less than 0.5 percent by weight; and

dispersing a viscosity reducing proportion of the humate in the water-based drilling mud;

said mud comprising an aqueous suspension of clay.

4,311,601

USE OF HETEROPOLYSACCHARIDE S-119 AS A WARP SIZE

Joseph S. Racciato, San Diego, Calif., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 13, 1980, Ser. No. 177,691

Int. Cl.[3] D06M *15/04*

U.S. Cl. 252—8.6 10 Claims

1. A warp size which comprises an aqueous solution of 2% to 15% (wt/wt) of a warp sizing agent which is Heteropolysaccharide S-119.

4,311,602

USE OF 2,4,6-TRIMETHYLCYCLOHEXANEMETHANOL DERIVATIVES IN AUGMENTING OR ENHANCING THE AROMA OF DRYER-ADDED FABRIC SOFTENER ARTICLES

Mark A. Sprecker, Sea Bright; Frederick L. Schmitt, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

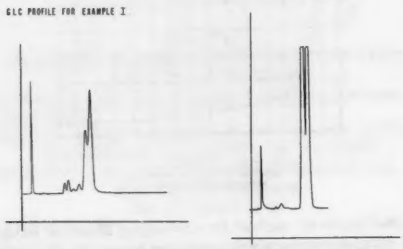
Division of Ser. No. 82,076, Oct. 5, 1979, which is a continuation-in-part of Ser. No. 953,128, Oct. 20, 1978, Pat. No. 4,195,099. This application Oct. 9, 1980, Ser. No. 195,529

Int. Cl.[3] D06M *13/16*

U.S. Cl. 252—8.6

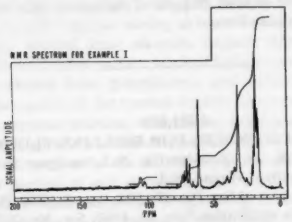
1 Claim

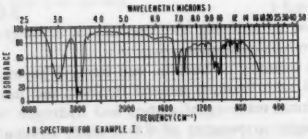
GLC PROFILE FOR EXAMPLE II.



GLC PROFILE FOR EXAMPLE I.

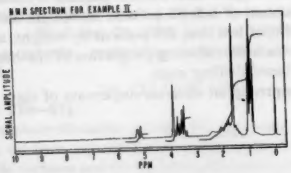
NMR SPECTRUM FOR EXAMPLE I

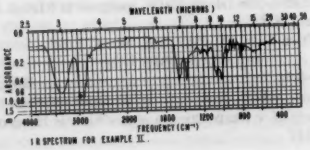




IR SPECTRUM FOR EXAMPLE I.

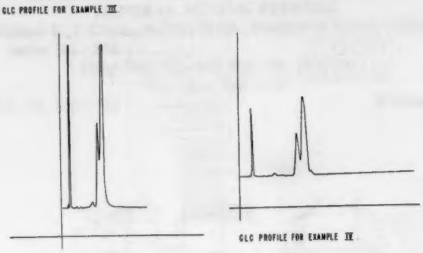
NMR SPECTRUM FOR EXAMPLE II





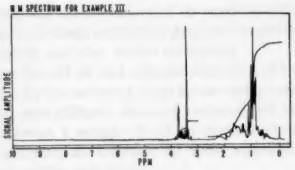
IR SPECTRUM FOR EXAMPLE II.

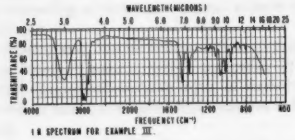
GLC PROFILE FOR EXAMPLE III.



GLC PROFILE FOR EXAMPLE IV.

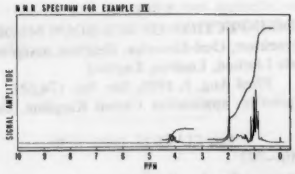
NMR SPECTRUM FOR EXAMPLE III

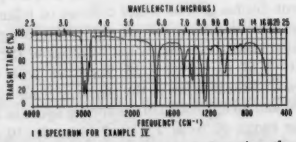




IR SPECTRUM FOR EXAMPLE III.

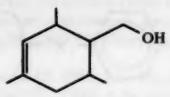
NMR SPECTRUM FOR EXAMPLE IV





IR SPECTRUM FOR EXAMPLE IV.

1. The process for augmenting or enhancing the spicy aroma created by the use of a drier-added fabric softener article comprising the step of intimately admixing with any component of said drier-added fabric softener article prior to forming said article, from 0.01% up to 0.5% by weight of said drier-added fabric softener article of the compound having the structure:



4,311,603

SOLAR COLLECTOR WITH DARK SOLUTION

Michael P. Neary, 825 Calle Mejia, Apt. 934, Santa Fe, N. Mex. 87501, and Thomas A. Wilson, 42 Reni Rd., Manhasset, N.Y. 11030

Filed Mar. 21, 1979, Ser. No. 22,734
Int. Cl.[3] C09K *5/00;* F24J *3/02*
U.S. Cl. 252—70 4 Claims

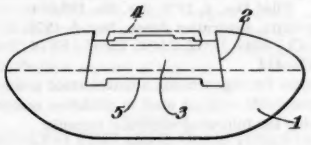
1. A solar collector of fluid type wherein said fluid comprises water and an additive dissolved therein such that said fluid plus additive is characterized by an extinction coefficient greater than 10^4, absorbs over a wavelength from 300 to 1000 nm, and is neither toxic nor inflammable, said additive being selected from the group consisting of nickel sulfate hexahydrate, cobalt sulfate heptahydrate and iodine and potassium iodide.

4,311,604

SOAP BAR AND PROCESS FOR ITS MANUFACTURE

Hans W. Hörnig, Horb, Fed. Rep. of Germany, assignor to Biendax-Werke R. Schneider GmbH & Co., Mainz, Fed. Rep. of Germany

Continuation of Ser. No. 49,093, Jun. 18, 1979, abandoned. This application Dec. 2, 1980, Ser. No. 212,150
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1979, 2910106
Int. Cl.[3] C11D *13/08, 13/14, 13/28, 17/04*
U.S. Cl. 252—90 8 Claims



1. In a soap bar consisting of a soap bar body and at least one smaller piece of soap embedded in a corresponding cavity in at least one surface of the body, the improvement comprises providing a raised relief design at the bottom of the soap bar body cavity to which said smaller piece is embedded, said smaller piece having a shape which corresponds to and compliments said soap bar cavity whereby the cavity is substantially filled by said small piece, wherein the outer surface of the smaller piece of soap embedded in the soap bar body has the same raised relief design as provided in the bottom of the soap bar body cavity and wherein the soap bar body and the embedded smaller piece of soap are of different colors.

4,311,605

COMPOSITIONS FOR TREATING TEXTILES

Claude Eckhardt, Riedisheim, France, and Richard von Rütte, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 22, 1980, Ser. No. 189,486
Claims priority, application Switzerland, Sep. 28, 1979, 8789/79
Int. Cl.[3] C11D *7/54, 7/50*
U.S. Cl. 252—102 25 Claims

1. In a composition for improving the appearance of used, in particular soiled, textiles, the improvement comprising the use of 0.0001 to 1% of a photoactivator, and 0.005 to 1.5%, in each case based on the total weight of the composition, of a fluorescent whitening agent selected from the group consisting of distyrylbiphenylsulfonic acids and their salts, 4,4'-bis-(1,2,3-triazol-2-yl)-2,2'-stilbenesulfonic acids and their salts, and mixtures thereof.

4,311,606

METHOD FOR MANUFACTURE OF NON-GELLING, STABLE INORGANIC SALT CRUTCHER SLURRIES

James A. Kaeser, Somerset, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 128,574, Mar. 10, 1980. This application Oct. 21, 1980, Ser. No. 199,601
The portion of the term of this patent subsequent to Oct. 13, 1998, has been disclaimed.
Int. Cl.[3] C11D *3/08, 3/10, 3/20, 11/02*
U.S. Cl. 252—135 16 Claims

1. A method of retarding or preventing the gelation of a crutcher slurry containing from about 40 to 70% of solids and 60 to 30% of water, of which solids content, on a 100% solids basis, about 55 to 85% is sodium bicarbonate, about 5 to 25% is sodium carbonate and about 5 to 25% is sodium silicate of $Na_2O:SiO_2$ ratio within the range of 1:1.4 to 1:3, with the ratio of sodium bicarbonate:sodium carbonate being within the range of about 2:1 to 8:1, the ratio of sodium carbonate:sodium silicate being within the range of about 1.3 to 3:1, and the ratio of sodium bicarbonate:sodium silicate being within the range of about 2:1 to 10:1, which comprises preparing a crutcher slurry of the described composition by admixing with other components of such slurry, an amount of sodium sesquicarbonate which will supply from about 30 to 100% of the sodium carbonate.

4,311,607

METHOD FOR MANUFACTURE OF NON-GELLING, STABLE ZEOLITE - INORGANIC SALT CRUTCHER SLURRIES

James A. Kaeser, Somerset, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 157,568, Jun. 9, 1980, which is a continuation-in-part of Ser. No. 128,574, Mar. 10, 1980. This application Oct. 21, 1980, Ser. No. 199,603
The portion of the term of this patent subsequent to Oct. 13, 1998, has been disclaimed.
Int. Cl.[3] C11D *3/08, 3/10, 3/12, 11/02*
U.S. Cl. 252—140 18 Claims

1. A method of retarding or preventing the gelation of a crutcher slurry containing from about 40 to 70% of solids and 60 to 30% of water, of which solids content, on a 100% solids basis, about 20 to 60% is zeolite, about 11 to 45% is sodium bicarbonate, about 4 to 20% is sodium carbonate and about 5 to 20% is sodium silicate of $Na_2O:SiO_2$ ratio within the range of 1:1.4 to 1:3, with the ratio of sodium bicarbonate:sodium carbonate being within the range of about 1.2:1 to 8:1, the ratio of sodium carbonate:sodium silicate being within the range of about 1:3 to 3:1, the ratio of sodium bicarbonate:sodium silicate being within the range of about 1.5:1 to 5:1 and the ratio of zeolite to the sum of sodium bicarbonate, sodium carbonate and sodium silicate being within the range of about 1:4 to 4:1, which comprises preparing a crutcher slurry of the described composition by admixing with other components of such slurry an amount of sodium sesquicarbonate which will supply from about 20 to 100% of the sodium carbonate.

4,311,608

ALL PURPOSE CLEANER

Joe G. Maurice, 1208 Terrace Trail, Hurst, Tex. 76053

Filed Oct. 8, 1980, Ser. No. 195,175
Int. Cl.[3] C11D *1/14, 1/22, 1/72, 1/831*
U.S. Cl. 252—143 2 Claims

1. A cleaning solution consisting essentially of about 6.25%

to 18.75% of isopropyl alcohol, about ½% to 1.5% of linear dodecylbenzene sulfonic acid, about 4.5% to 12.5% of a primary alcohol containing 9 to 11 carbon atoms and an average of about 6 moles of ethylene oxide per mole of alcohol, about 4.5% to 12.5% of a primary alcohol containing 9 to 11 carbon atoms and an average of about 2.5 moles of ethylene oxide per mole of alcohol, about 43.75% to 70% of sodium lauryl sulfate and not more than about 4.5% of dy-methol poly siloxane emulsified in water.

4,311,609

METHOD OF PRODUCING INORGANIC WATER-SOFTENING BEADS

Joseph E. Wagner, III, Newark, Del., and Lloyd E. Williams, Bel Air, Md., assignors to J. M. Huber Corporation, Locust, N.J.

Continuation-in-part of Ser. No. 26,390, Apr. 2, 1979, Pat. No. 4,230,593, which is a continuation-in-part of Ser. No. 883,007, Mar. 3, 1978, abandoned. This application Jul. 25, 1980, Ser. No. 172,336

The portion of the term of this patent subsequent to Oct. 28, 1997, has been disclaimed.

Int. Cl.[3] **B01J** *39/14;* **C01B** *33/28;* **C02F** *1/42;* **C11D** *3/12*

U.S. Cl. 252—179 **3 Claims**

1. A method of producing non-water dispersible water-softening beads comprising the steps of:

(a) adding from 80 to 90 parts of a sodium alumino silicate having a silica to aluminum oxide molar ratio of between 2:1 and 4:1 and a sodium oxide to aluminum oxide molar ratio of between 0.8:1 and 1.2:1 and from 10 to 20 parts of low density polyethylene to a pelletizer selected from the group consisting of disc pelletizers, pinmixers and drum pelletizers.

(b) heating the silicate and polyethylene to the softening point of the polyethylene while forming beads in the pelletizer;

(c) cooling the beads to below the softening point of the polyethylene;

(d) removing the cooled beads from the pelletizer; and

(e) screening the beads to obtain beads having a diameter of between 200 and 1000 microns and a calcium capacity of at least 200 mg calcium carbonate/g.

4,311,610

LIQUID CRYSTALLINE 5-ALKYL-2 (4-ACYLOXY-PHENYL)-PYRIMIDINE

Horst Zaschke; Dietrich Demus; Adalbert Wiegeleben, and Uta Böttger, all of Halle, German Democratic Rep., assignors to VEB Werk für Fernsehelektronik im VEB Kombinat Mikroelektronik, Berlin-Oberschöneweide, German Democratic Rep.

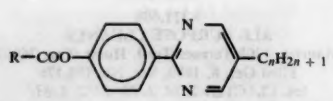
Filed Aug. 20, 1980, Ser. No. 179,856

Claims priority, application German Democratic Rep., Aug. 20, 1979, 215057; Aug. 20, 1979, 215058

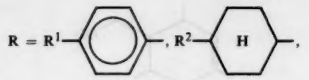
Int. Cl.[3] **C09K** *3/34;* **G02F** *1/13;* **C07D** *239/32*

U.S. Cl. 252—299.61 **22 Claims**

1. 5-alkyl-2-(4-acyloxyphenyl)-pyrimidines of the general formula



wherein



$R^1 = C_nH_{2n+1}$, $C_nH_{2n+1}O$, $C_nH_{2n+1}OCOO$, $C_nH_{2n+1}COO$, $C_nH_{2n+1}S$, F, Cl, Br, NO_2, CN, CF_3,

$R^2 = C_nH_{2n+1}$ n=1 to 10.

21. An electro-optical device containing nematic liquid crystalline substances for the modulation of incident or transmitted light and for the display of numbers, symbols and images, wherein said substances are 5-alkyl-2-(4-acyloxyphenyl)-pyrimidines according to claim 1 and are used singly, in mixtures with each other, or in mixtures with other liquid crystalline or non-liquid crystalline substances.

22. An electro-optical device of claim 21, wherein a mixture is used of n-propylcyclohexanecarboxylic acid-4-cyanophenylester, n-butylcyclohexanecarboxylic acid-4-cyanophenylester, n-pentylcyclohexanecarboxylic acid-4-cyano-phenylester and 5-n-hexyl-2-(4-n-hexylbenzoyloxyphenyl)-pyrimidine.

4,311,611

PROCESS FOR REGENERATING AN ANTIMONY CONTAINING OXIDE CATALYST

Yutaka Sasaki, Yokohama; Kiyoshi Moriya, Kanagawa, and Yoshimi Nakamura, Kawasaki, all of Japan, assignors to Nitto Chemical Industry, Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1979, Ser. No. 100,074

Claims priority, application Japan, Dec. 5, 1978, 53-149637

Int. Cl.[3] **B01J** *23/92, 23/96;* **C07C** *120/14, 5/48*

U.S. Cl. 252—412 **10 Claims**

1. A process for regenerating a deteriorated antimony containing metal oxide catalyst used in oxidative reactions with olefins having the following empirical formula:

$$Me_aSb_bX_cR_dQ_eO_f$$

wherein Me is at least one element selected from the group consisting of Fe, Co, Ni, Mn, U, Ce, Sn and Cu; X is at least one element selected from the group consisting of V, Mo, W, Nb and Ta; R is at least one element selected from the group consisting of B, P, Bi and Te; Q is at least one element selected from the group consisting of Mg, Ca, Sr, Ba, La, Ti, Zr, Cr, Re, Ru, Os, Rh, Ir, Pd, Pt, Ag, Zn, Cd, Al, Ga, In, Tl, Si, Ge, Pb, As, S and Se; the subscripts a, b, c, d, e and f represent atomic ratios, and where a is 10, b is 5 to 60, c is 0 to 30, d is 0 to 10, e is 0 to 20, and f is the number of oxygen atoms that combine with these components to form an oxide which comprises impregnating or spraying said antimony containing metal oxide catalyst with 0.05 to 60 wt % based on said catalyst of an aqueous hydrogen peroxide solution, having a concentration of about 0.5 to 35 wt %, drying thus impregnated catalyst, and calcining the catalyst from 400° to 1,000° C.

3. The process of claim 1, wherein said aqueous hydrogen peroxide solution additionally contains at least one member selected from the group consisting of vanadic acid, molybdic acid, tungstic acid and salts thereof.

4. The process of claim 1, wherein said aqueous hydrogen peroxide solution additionally contains a compound prepared by oxidizing metallic tellurium, tetravalent telluride or tellurium oxide hydrate with hydrogen peroxide.

4,311,612
OLEFIN POLYMERIZATION CATALYST

David E. Boone, Chicago, and James L. Jezl, St. Charles, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 25, 1980, Ser. No. 180,973
Int. Cl.[3] C08F *4/64, 4/68*
U.S. Cl. 252—429 B 10 Claims

1. An olefin polymerization catalyst component comprising the reaction product of components comprising

(A) at least one Group IVB or VB metal-containing component selected from the group consisting of

(1) compounds corresponding to the formula $(O)_p$. $M(OR)_nX_m$ wherein M is a higher valent Group IVB or VB metal, R is hydrocarbyl, X is halogen, p is 0 or 1 and m and n are numbers equal to or greater than 0 such that m+n+2p equals the valance of M; and

(2) compounds prepared by reaction of (1) with at least one nonreducing halogenating agent; and

(B) at least one support material selected from the group consisting of

(1) a reaction product of at least one magnesium alcoholate with at least one halocarboxylic acid, said acid being used in an amount effective to form an initially soluble reaction product with said alcoholate, said reaction being conducted in an inert solvent for the halocarboxylic acid and in the substantial absence of water, oxygen, carbon oxides and other extraneous catalyst poisons; and

(2) a reaction product of (1) with at least one halogenating agent;

said components (A) and (B) being reacted at about 0° to about 200° C. in the substantial absence of oxygen, water, carbon oxides and other extraneous catalyst poisons in amounts such that the atomic ratio of Group IVB or VB metal in (A) to magnesium in (B) ranges from about 0.01:1 to about 100:1; provided that when the amount of reactive halogen in (A) and (B) is less than an amount effective to give an active catalyst component, said reaction product of (A) and (B) is reacted in the substantial absence of water, oxygen, carbon oxides and other extraneous catalyst poisons with at least one halogenating agent (C) in an amount such that (A), (B) and (C) contain at least an effective amount of halogen.

4,311,613
CATALYST PREPARED FROM TUNGSTEN HEXAFLUORIDE AND A BRANCHED-CHAIN ALCOHOL

John P. Pellegrini, Jr., O'Hara Township, Allegheny County, Pa.; Richard G. Austin, Ridgewood, N.J., and David L. Beach, Gibsonia, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 15, 1980, Ser. No. 216,125
Int. Cl.[3] B01J *31/02*
U.S. Cl. 252—429 R 10 Claims

1. The method of making a catalyst which comprises reacting tungsten hexafluoride with a branched-chain aliphatic alcohol having between three and about ten carbon atoms and having at least one branch no more than two carbon atoms removed from the hydroxyl carbon atom in a molar ratio of between about 2:1 to about 20:1.

4,311,614
CATALYSTS FOR WATER DEALKYLATION OF AROMATIC HYDROCARBONS

Michel Grand, Serezin du Rhone, and Daniel Duprez, Poitiers, both of France, assignors to Elf Union, Paris, France

Continuation of Ser. No. 17,328, Mar. 5, 1979, abandoned. This application May 29, 1980, Ser. No. 154,362
Claims priority, application France, Mar. 7, 1978, 78 06424
Int. Cl.[3] B01J *21/04, 23/42, 23/44, 23/46*
U.S. Cl. 252—466 PT 14 Claims

1. A water dealkylation catalyst for an aromatic hydrocarbon consisting essentially of from 0.1 to 5% by weight of (A) one or two metals selected from the group consisting of rhodium, platinum, palladium and iridium or (B) Rh with at least one metal selected from the group consisting of Pt, Pd, Ir and Mn deposited on a gamma alumina carrier, said catalyst having improved properties of activity, selectivity and stability wherein said catalyst is prepared by:

(a) pretreating said gamma alumina carrier in an aqueous medium for 15 minutes to 78 hours, at a pH from 1 to 10, at a temperature of 0° to 100° C.;

(b) impregnating the pretreated gamma alumina carrier with an aqueous or acid solution of a salt of the metal, to a total concentration of metal in the carrier of from 0.1 to 5% by weight;

(c) drying said impregnated carrier;

(d) calcining said dried impregnated carrier in air;

(e) reducing the calcined impregnated carrier in a hydrogen current at 400°–500° C.;

(f) treating the reduced impregnated carrier with a water vapor current at 400° to 600° C. for a period of 5 minutes to 15 hours whereby the catalyst is formed.

4,311,615
ELECTRICALLY CONDUCTIVE PALLADIUM CONTAINING POLYIMIDE FILMS

Robert R. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Larry T. Taylor, Blacksburg; Anne K. St. Clair, Poquoson, both of Va.; Vicki C. Carver, Abilene, Tex., and Thomas A. Furtsch, Cookeville, Tenn.

Filed Mar. 28, 1980, Ser. No. 135,058
Int. Cl.[3] H01B *1/02*
U.S. Cl. 252—514 12 Claims

1. A method for preparing a palladium (II) ion-containing polyamic acid solution which comprises:

reacting an aromatic dianhydride with an equimolar quantity of an aromatic diamine followed by the addition of a palladium (II) ion-containing salt or complex selected from the group consisting of Li_2PdCl_4, $Pd[S(CH_3)_2]_2Cl_2$ and $PdCl_2$;

the dianhydride and diamine reactants being previously dissolved in a solvent or mixture of solvents at least one of which is selected from the group consisting of,

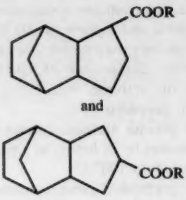
N,N-dimethylacetamide,
N,N-dimethylformamide,
N-methyl-2-pyrrolidone,
dimethylsulfone,
tetrahydrofuran,
m- or p-dioxane,
bis(2-methoxyethyl)ether, and
1,2-bis(2-methoxyethoxy)ethane.

4,311,616
METHOD OF PREPARING PERFUME COMPOSITIONS THAT CONTAIN TRICYCLO[5.2.1.$0^{2,6}$]DECANE CARBOXYLIC ACID ESTERS

Ulf-Armin Schaper, Nixenstrasse 17, 4000 Düsseldorf-13, and Klaus Bruns, Notburgaweg 6, 4150 Krefeld-Traar, both of Fed. Rep. of Germany

Filed Aug. 10, 1979, Ser. No. 65,606
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1978, 2835445
Int. Cl.[3] C11B *9/00;* A61K *7/46*
U.S. Cl. 252—522 R 5 Claims

1. The method of imparting desired aroma which comprises administering an aroma-imparting amount of the perfume composition comprising as a perfume from about 1 to 50 percent by weight of an isomeric mixture of tricyclo[5.2.1.$0^{2,6}$]-decane carboxylic acids of the general formulas



wherein R represents a saturated or unsaturated linear or branched aliphatic hydrocarbon radical having from about one to five carbon atoms, the remainder comprising customary constituents including at least one other perfume.

4,311,617

PERFUMERY COMPOSITIONS

Hifzur R. Ansari, Rayleigh; Benjamin O. Isaac, Ilford, and Horst R. Wagner, Woodford Green, all of England, assignors to Bush Boake Allen Limited, London, England

Continuation of Ser. No. 915,126, Jun. 13, 1978, abandoned, which is a continuation of Ser. No. 810,044, Jun. 27, 1977, abandoned, which is a continuation of Ser. No. 689,377, May 24, 1976, abandoned. This application Jun. 24, 1980, Ser. No. 162,326

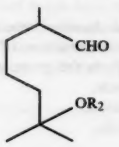
Claims priority, application United Kingdom, May 29, 1975, 23413/75

Int. Cl.³ A61K *7/46*

U.S. Cl. 252—522 R **7 Claims**

1. A perfume composition consisting essentially of perfume components comprising

perfume component (i) selected from the compounds having the formula



wherein R_2 is an alkyl group having from 1 to 4 carbon atoms, and

perfume component (ii) which contains at least one odoriferous compound selected from the group consisting of 2,6 dimethyl 2 alkoxy octan-7-ols, vetivert oil, vetiverol, vetiveryl acetate, guaiac wood oil, guaiac wood acetate, coumarin, musk ketone, lauric aldehyde, benzyl acetate, dimethyl benzyl carbinol, dimethyl benzyl carbinyl acetate, rose absolute, jasmin absolute, ionones, iso-nonyl acetate, methyl phenyl acetate, styrallyl acetate, β-phenyl ethanol, citronellol, citronellal, geranium oil, geraniol, linalool, nerol, lavandin oil, linalyl acetate, patchouli oil, petitgrain oil, bergamot oil, heliotropin, ethylene brassylate, undecyl aldehyde, cinnamaldehyde, benzyl salicylate, cinnamyl alcohol, clove bud oil, bay oil, nutmeg oil, pimento berry oil, terpineol, ylang oil, benzyl benzoate, sandalwood oil, clary sage oil, amyl salicylate, labdanum resin, methyl ionones, dihydromyrcenol, orange oil, vanillin, ethylvanillin, olibanum resin, musk ambrette, rhodinol, mandarin oil, methyl nonyl acetaldehyde, neroli oil, cedrol, oakmoss, isovalanone, hydrogen, and alkyl groups having from 1 to 4 carbon atoms.

4,311,618

CLEANSER WITH IONIC AND NONIONIC SURFACTANTS

Werner Schäfer-Burkhard, Auf der Wacht 33, CH-4104 Oberwil-Bl, Switzerland

Continuation-in-part of Ser. No. 887,904, Mar. 17, 1978, abandoned. This application Aug. 5, 1980, Ser. No. 175,595

Claims priority, application Switzerland, Mar. 18, 1977, 3471/77

Int. Cl.³ C11D *1/83, 1/835, 3/30, 3/43*

U.S. Cl. 252—542 **37 Claims**

1. A water soluble cleanser concentrate composition comprising:

(a) at least one ionic surfactant present in the amount of about 3% to about 20% weight;

(b) at least one nonionic surfactant having an HLB value from about 5 to 20, present in the amount from about 3% to about 20% by weight;

(c) at least one amphoterically dissociating agent capable of breaking bridge bonds in cross-linked proteins, said agent being present in the amount from about 4% to about 40% by weight;

(d) at least one aprotic, organic, lipophilic solvent present in the amount from about 5% to about 50% by weight; said composition being essentially free of metal ions and phosphates.

2. A composition according to claim 1 wherein said ionic surfactant is an anionic surfactant.

3. A composition according to claim 2 wherein said anionic surfactant has the formula:

$$R\text{-}B^{-}.C+$$

where in R is a hydrophobic moiety selected from the group consisting of: linear or branched chain aliphatic hydrocarbons with greater than six carbon atoms, alkyl and polyalkyl substituted aromatics, and alkyl-substituted heterocyclic moieties, B is a hydrophilic moiety containing at least one functional group selected from the group consisting of sulfonic acid and carbonic acid; and C is a cationically dissociating moiety selected from the group consisting of aliphatic, aromatic, and heterocyclic ammonium, hydrazonium, amino and imino compounds.

4,311,619

COLD SET PHENOL-FORMALDEHYDE RESIN

Charles E. Seeney, Brazil; John F. Kraemer, and Larry J. Hoffman, both of Terre Haute, all of Ind., assignors to Aristo Corporation, Detroit, Mich.

Filed Apr. 14, 1980, Ser. No. 139,304

Int. Cl.³ C08G *8/10*

U.S. Cl. 260—7 **23 Claims**

1. A resin prepolymer obtained by a process comprising the steps of reacting a phenol and an aldehyde in a mole ratio of from 1 to 1–2.3 at a temperature of from 100° C. to 130° C. in the presence of catalytic amounts of organic derivatives of titanium, ziconium or alkyl and alkoxide derivatives of aluminum.

4,311,620

FOUNDRY AGGREGATE BINDERS AND FOUNDRY COMPOSITIONS PREPARED THEREFROM

Donald W. Sherwood, Kenmore, and Daniel T. Riordan, Buffalo, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

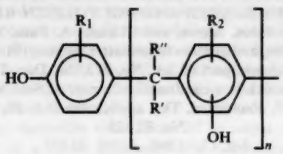
Filed May 8, 1980, Ser. No. 147,780

Int. Cl.³ C08L *61/16;* **C08G** *8/02;* **C08L** *5/00*

U.S. Cl. 260—9 **50 Claims**

1. A binder composition for foundry aggregates which comprises a solution of an inert solvent and a room temperature curable composition consisting essentially of the components:

(1) a phenol-ketone resin having the general formula:



wherein R′ and R″ are alkyl of 1 to 6 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, or haloalkyl of 1 to 6 carbon atoms, and can be the same or different, R_1 and R_2 are hydrogen, alkyl of 1 to 6 carbon atoms, or halogen, and n is an average of about 1.1 to 10, and

(2) an organic polyisocyanate in a proportion to provide from about 0.9 to 1.1 reactive isocyanate groups per reactive hydrogen present in said curable composition.

4,311,621
PROCESS FOR PRODUCING A FILLER FOR ADHESIVE FOR BONDING WOOD

Yoshihiko Nishizawa; Toshio Furukawa, both of Noda; Teruo Goto, and Hirotsugu Onishi, both of Matsue, all of Japan, assignors to Kikkoman Corporation, Noda, Japan

Filed Apr. 24, 1980, Ser. No. 143,187

Claims priority, application Japan, Apr. 26, 1979, 54-50857; Apr. 27, 1979, 54-51525

Int. Cl.³ B32B *21/08, 27/42;* **C08L** *1/02;* **C09J** *3/04*

U.S. Cl. 260—17.2 **16 Claims**

1. An adhesive composition for bonding wood products comprising a thermosetting resin adhesive and a vegetable cellulosic filler material produced by a method comprising contacting a raw material composed of a vegetable cellulosic material with saturated steam or superheated steam to heat-treat it.

4,311,622
THIXOTROPIC COATING COMPOSITION

Roelof Buter, Dieren, Netherlands, assignor to Akzo NV, Arnhem, Netherlands

Continuation of Ser. No. 853,474, Nov. 21, 1977, abandoned. This application Jan. 31, 1980, Ser. No. 117,228

Claims priority, application Netherlands, Nov. 25, 1976, 7613121

Int. Cl.³ C09D *5/04*

U.S. Cl. 260—18 EP **10 Claims**

1. A thixotropic coating composition containing a binder and 0.1 to 30% by weight of a reaction product of an organic diisocyanate and benzylamine as a sag control agent.

4,311,623
BLUE-GRAY LOW INFRARED EMITTING COATING

Robert F. Supcoe, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 20, 1981, Ser. No. 245,859

Int. Cl.³ C09D *3/82, 5/32, 5/38*

U.S. Cl. 260—18 S **6 Claims**

1. A diffuse blue-gray coating formulation having a low infrared emittance essentially comprises, by weight:

about 10–20% non-leafing aluminum powder;

about 3–7% aluninum oxide;

about 5–9% zinc sulfide;

about 40–60% silicon alkyd resin;

about 8–14% antimony trisulfide;

about 10% mineral spirits;

about 1–2% blue pigments; and

a remainder including UV stabilizer, dispersing agent, and drier.

4,311,624
AUTOXIDIZABLE COMPOSITIONS

William D. Emmons, Huntingdon Valley, and Fred A. Kaplan, North Wales, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jul. 2, 1980, Ser. No. 165,878

Int. Cl.³ C08L *91/00*

U.S. Cl. 260—22 CB **20 Claims**

1. A coating and/or impregnating composition, adapted to be cured in the presence of oxygen, comprising:

(1) from about 5% to about 75% by weight, based on the total of components (1) and (2), of a reactive, non-volatile, diluent monomer system comprising

(a) from about 1% to about 99% by weight of monomer system of at least one member selected from the group consisting of dicyclopentenyloxyalkyl esters of a polymerizable ethylenically unsaturated monocarboxylic acid or dicarboxylic acid, and

(b) from about 1% to about 99% by weight of monomer system of at least one member selected from the group consisting of methacryloxyalkyl esters and acryloxyalkyl esters of drying oil, or semi-drying oil, fatty acids;

(2) from about 95% to about 25% by weight, based on the total of components (1) and (2), of a film-forming component selected from the group consisting of

(a) drying oils,

(b) film-foring alkyd resins having autoxidative functionality and oil-free polyesters having maleate or fumarate functionality,

(c) film-forming vinyl addition polymers having ethylenic unsaturation having autoxidizable characteristics selected from those vinyl addition polymers having pendant allylic functionality and those vinyl addition polymers having pendant drying oil functionality,

(d) film-forming polymeric binders lacking any appreciable inherent autoxidizable functionality, and

(e) film-forming condensation polymers modified with acrylate or methacrylate functionality, and

(3) an effective amount of a polyvalent metal-containing complex or salt that catalyzes the autoxidative curing at components (1) and (2).

4,311,625
WATER-BORNE SURFACE-COATING COMPOSITIONS CONTAINING COMPLEXED COBALT DRIERS

Samuel J. Bellettiere, Piscataway; Raymond Hurley, New Brunswick, both of N.J., and Samuel Hoch, Brooklyn, N.Y., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Nov. 10, 1980, Ser. No. 205,834

Int. Cl.³ C08L *91/00, 67/06*

U.S. Cl. 260—22 R **10 Claims**

1. A water-borne surface-coating composition that comprises an oxidizable organic film-forming resinous vehicle, water, and a drier system that comprises a complex that is the product of the reaction of a cobalt salt of a monocarboxylic acid having 2 to 24 carbon atoms with a potassium salt of a monocarboxylic acid having 2 to 24 carbon atoms in amounts that will provide 2 moles of said potassium salt per mole of said cobalt salt in a solvent mixture that contains from 20% to 80% by weight of polar solvent and 20% to 80% by weight of non-polar solvent, said drier system having a total metal content of from 5% to 14% by weight and being present in an amount that will provide from 0.075% to 0.375% by weight of cobalt and from 0.125% to 0.625% by weight of potassium, based on the weight of said resinous vehicle.

4,311,626

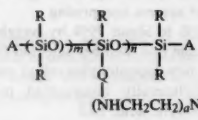
SILICONE COMPOSITIONS FOR THE TREATMENT OF FIBERS

Isao Ona, Sodegaura; Masaru Ozaki, and Katsutoshi Usui, both of Ichihara, all of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Sep. 25, 1980, Ser. No. 191,038
Int. Cl.[3] C08L 83/04, 83/06; C08K 5/01; D06M 15/66
U.S. Cl. 260—29.2 M 5 Claims

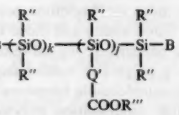
1. A fiber-treating composition comprising

(a) a polydiorganosiloxane having the formula



wherein each R represents a monovalent hydrocarbon residue having from 1 to 20 carbon atoms, R′ represents a hydrogen atom or a monovalent hydrocarbon residue, A represents R or —Q—$NHCH_2CH_2$—$_a$ NHR′, Q represents a divalent hydrocarbon residue, m is a positive integer, n is an integer, m+n has a value of at least 10, m/(n+2) has a value of from 5/1 to 500/1, and a is an integer from 0 to 10 and which contains at least two —Q—$NHCH_2CH_2$—$_a$NHR′ groups per molecule; and

(b) a polydiorganosiloxane having the formula general formula



wherein each R″ represents a monovalent hydrocarbon residue having from 1 to 20 carbon atoms, R‴ represents a hydrogen atom or a monovalent hydrocarbon residue, B represents R″ or —Q—COOR‴, Q′ represents a divalent hydrocarbon residue, k is a positive integer, j is an integer, k+j has a value of at least 10, k/(j+2) has a value of from 5/1 to 500/1 and which has at least two —Q′—COOR‴ groups per molecule.

4,311,627

PROCESS FOR CURING FOUNDRY CORES AND MOLDS

David A. Hutchings, Stow, Ohio, assignor to Consolidated Foundries and Mfg. Corp., Chicago, Ill.

Filed Oct. 29, 1980, Ser. No. 201,750
Int. Cl.[3] C08K 5/15
U.S. Cl. 260—30.4 R 11 Claims

1. A process for curing a core or mold made from a predominantly furan resin deposited on foundry sand, comprising, dispersing a ring-substituted aralkyl hydroperoxide so as to coat said sand, contacting said resin with sulfur dioxide gas at a temperature in the range from about 5° C. to about 100° C. to form an acid sulfate intermediate by combining with said hydroperoxide, and polymerizing said resin without the formation of sulfuric acid so as to chemically bind an aralkyl moiety in the structure of the polymerized resin.

4,311,628

THERMOPLASTIC ELASTOMERIC BLENDS OF OLEFIN RUBBER AND POLYOLEFIN RESIN

Sabet Abdou-Sabet, Akron, and Michael A. Fath, Wadsworth, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 973,769, Dec. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 849,773, Nov. 9, 1977, abandoned. This application Oct. 22, 1979, Ser. No. 87,123
Int. Cl.[3] C08L 23/26, 23/04
U.S. Cl. 260—33.6 AQ 60 Claims

1. In an elastoplastic composition comprising a blend of thermoplastic crystalline polyolefin resin and fully cured EPDM rubber in the form of small dispersed particles essentially of a size of about 50 microns number average or below, the improvement comprising a composition in which the rubber is cured with phenolic curative comprising phenolic curing resin and cure activator to the extent that the cured composition contains no more than about three percent by weight of curable rubber extractable in cyclohexane at 23° C. or no more than about five percent by weight of curable rubber extractable in boiling xylene.

4,311,629

METHOD FOR MAKING ANTIFOULING COATING COMPOSITION CONTAINING HYDROLYZED ORGANOTIN SILOXANE POLYMER

A. Peter Gysegem, Lebanon, Oreg., assignor to Ameron, Inc., Monterey, Calif.

Filed Nov. 12, 1980, Ser. No. 206,295
Int. Cl.[3] C09D 3/48, 3/82; C08G 77/04, 77/06
U.S. Cl. 260—33.6 SB 39 Claims

1. A method for preparing a solution containing hydrolyzed organotin siloxane polymeric material comprising the steps of:

combining an organotin R-oxy siloxane in which the ratio of tin atoms to silicon atoms is in the range of 1:50 to 1:1, where R represents a group consisting of alkyl and alkoxyalkyl radicals containing less than six carbon atoms, a water miscible solvent, water, a hydrolysis catalyst, and a water immiscible solvent; and

after hydrolysis of the organotin R-oxy siloxane, removing by distillation the water miscible solvent and R-alcohol from the hydrolysis reaction.

4,311,630

GASIFIABLE CARBON-GRAPHITE FIBERS

Marshall F. Humphrey, Duarte; Kumar N. R. Ramohalli, Pasadena, and Warren L. Dowler, Sierra Madre, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Apr. 17, 1979, Ser. No. 30,836
Int. Cl.[3] C08L 61/06
U.S. Cl. 260—38 14 Claims

1. A composition of matter comprising: graphite fibers having a diameter from 1 to 30 microns coated with 1.0 to 10% by weight of a salt of metal having a work function below 4.2 eV and said fibers being embedded in a binder resin.

4,311,631

LOW EMISSION FOUNDRY BINDER SYSTEM

Marion M. Myers, and William J. Tellefsen, both of Milwaukee, Wis., assignors to Delta Oil Products Corporation, Milwaukee, Wis.

Filed Sep. 20, 1979, Ser. No. 77,182
Int. Cl.[3] C08L 61/06
U.S. Cl. 260—38 21 Claims

1. The process of preparing shaped foundry products which comprises:

(a) forming a foundry mix containing at least 90% by weight of a foundry aggregate having sand as a major constituent by uniformly distributing on said aggregate from about 45 to 65 parts by weight of a binder comprising a phenolic

compound and from 20 to 40% by weight of a reactive diluent, said phenolic compound comprising a mixture of low molecular weight methylolated phenols and said reactive diluent comprising an aliphatic hydroxyl compound having from about 5 to about 10 carbon atoms in the aliphatic group, said binder being substantially free of hydrocarbon solvents;

(b) mixing therewith from about 35 to about 55 parts by weight of a liquid polyisocyanate substantially free of solvents;

(c) shaping the foundry mix in a mold; and

(d) permitting said binder composition to react with said polyisocyanate to form a thermoset copolymer and to bind the shaped foundry mix in the absence of hydrocarbon solvents.

4,311,632

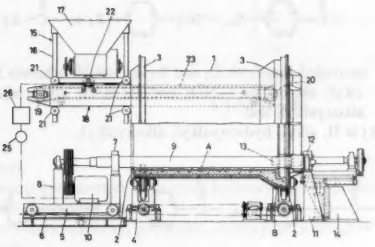
PROCESS FOR MOLDING A CONCRETE PIPE

Kunizo Hiraoka, Tokyo, Japan, assignor to Hiraoka Giken Kogyo Co., Ltd., Saitama, Japan

Filed Jun. 16, 1980, Ser. No. 159,923

Int. Cl.³ B28B *21/24*

U.S. Cl. 264—40.5 **4 Claims**



1. A process of molding a concrete pipe comprising the steps of spreading fresh concrete for molding a concrete pipe over the full length of a rotating molding flask, the water content of said fresh concrete being 22% to 30%, smoothing the surface of said fresh concrete from inside by means of a pressing roller, distributing some more fresh concrete at intervals between both ends of said rotating molding flask, and compacting said fresh concrete by means of said pressing roller in each place where said fresh concrete has been distributed, characterized in that the attainment of a predetermined degree of compactedness of concrete is electrically detected in each place through said pressing roller during the distribution of fresh concrete and that when a predetermined degree of compactedness of concrete is attained in one place, a belt conveyor for feeding said rotating molding flask with fresh concrete is automatically moved to the next place and operation is repeated in each place until the full length of said molding rotating flask is covered by such operation.

4,311,633

MODIFIED POLYPHENYLENE ETHER COMPOSITIONS

Gim F. Lee, Jr., Albany, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Aug. 4, 1980, Ser. No. 174,935

Int. Cl.³ C08L *51/04, 71/04*

U.S. Cl. 260—42.18 **8 Claims**

1. A thermoplastic composition, which comprises:

(a) a polyphenylene ether resin;

(b) a polystyrene which has been modified with a rubbery interpolymer of a mixture of mono-olefins and a polyene; and

(c) a copolymer of styrene and butyl acrylate.

4,311,634

HEAT STABLE POLYMER COATING COMPOSITION WITH ANTIOXIDANT

Eustathios Vassiliou, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 892,297, Mar. 31, 1978, abandoned, which is a continuation-in-part of Ser. No. 606,298, Aug. 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 552,870, Feb. 25, 1975, abandoned, and a continuation-in-part of Ser. No. 509,938, Sep. 27, 1974, abandoned. This application Mar. 31, 1980, Ser. No. 136,166

Int. Cl.³ C08K *3/04*

U.S. Cl. 260—42.27 **10 Claims**

1. A coating composition having a pH of at least about 8.0 and consisting essentially of

(a) a heat-stable polymer stable at temperatures above 300° C. which is selected from the group consisting of silicone, polysulfide, polymerized parahydroxy benzoic acid, polysulfonate, polysulfonamide, or fluorocarbon polymers, or a mixture thereof;

(b) colorant which is carbon, carbonaceous residue, or a mixture thereof;

(c) antioxidant which is a decomposable salt of phosphoric acid and an organic base or ammonia, said organic base or ammonia being present in a proportion in excess of that needed to completely neutralize the phosphoric acid, said salt optionally including amine, 2-ethylhexyldiphenyl phosphate, magnesium glycerophosphate, calcium glycerophosphate, iron glycerophosphate, or mixtures of the above; and

(d) liquid carrier.

4,311,635

FLAME RESISTANT THERMOPLASTIC ELASTOMER

Stanley Pearson, Trenton, N.J., assignor to Pantasote Inc., Greenwich, Conn.

Filed Aug. 25, 1980, Ser. No. 180,927

Int. Cl.³ C08K *3/34*

U.S. Cl. 260—42.49 **16 Claims**

1. A polymeric composition, comprising

(1) a graft terpolymer of:

(a) from about 40 to about 60 parts by weight of a mixture from about 85 to about 100% by weight of vinyl chloride and from 0 to about 15% by weight of a copolymerizable monomer; graft copolymerized to

(b) from about 60 to about 40 parts by weight of a solid ethylene-vinyl acetate copolymer containing from about 15 to about 95% by weight of combined ethylene and the balance vinyl acetate; and

(2) from about 5 to about 100 parts by weight, per hundred parts by weight of the graft terpolymer, of a flame retardant, smoke and soot-inhibiting filler selected from the group consisting of kaolin, talc, silica or alumina.

4,311,636

FLAME-RETARDANT THERMOPLASTIC MATERIALS AND MOLDED PARTS THEREFROM

Klaus Hahn, Lampertheim; Walter Himmele, Walldorf; Herbert Naarmann, Wattenheim, and Klaus Penzien, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 10, 1979, Ser. No. 102,085

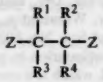
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1978, 2853992

Int. Cl.³ C08K *5/02, 5/34*

U.S. Cl. 260—45.8 N **3 Claims**

1. Improved flame-retardant thermoplastic materials comprising (a) polymers of styrene, and (b) organic halogen compounds in amounts effective as flame retardants, wherein the improvement comprises halogen-free compounds, having labile —C—C— linkages, synergistic with the flame retardants wherein said synergistic compounds contain amide or imide

grouping or mixtures of these groupings bonded to the —C—C— bridge member according to the formula:



and wherein R^1, R^2, R^3 and R^4 are selected from the group consisting of linear or branched saturated alkyl radicals containing 1 to 10 carbon atoms, saturated cyclic radicals containing 5 to 10 carbon atoms, and alkyl-substituted cycloaliphatic radicals containing 5 to 10 carbon atoms, and wherein Z is a heterocyclic amide or imide, saturated or unsaturated, which may or may not be substituted on the carbon atoms with alkyl or alkenyl radicals containing 1 to 4 carbon atoms, and which cyclic amide or imide may have an aromatic ring as part of the heterocyclic ring, and said aromatic ring may be substituted with alkyl radicals containing 1 to 4 carbon atoms.

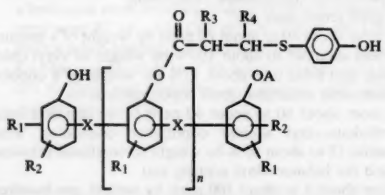
4,311,637

POLYPHENOLIC ESTERS OF MERCAPTOPHENOLS AS ANTIOXIDANTS

Kirkwood S. Cottman, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

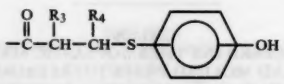
Filed Feb. 8, 1980, Ser. No. 119,692
Int. Cl.³ C08K *5/36*; C07C *149/40*
U.S. Cl. 260—45.85 B **20 Claims**

1. A polymer subject to oxidation having incorporated therein an antioxidant amount of a composition of matter conforming to the following structural formula:



(I)

wherein A is hydrogen or a radical of the structural formula:



and R_1 and R_2 are the same or different radicals selected from the group consisting of hydrogen radicals, alkyl radicals containing from 1 to 9 carbon atoms, aralkyl radicals containing from 7 to 9 carbon atoms, aryl radicals and alkylaryl radicals having from 7 to 9 carbon atoms; and wherein R_3 and R_4 are hydrogen or methyl radicals; and wherein X is the same or different radicals selected from the group consisting of cyclic dienes with nonadjacent carbon to carbon double bonds within the ring structure containing 5 to 20 carbon atoms from which the divalent radicals are prepared and a methylene radical of the formula $—CH_2—$, and wherein n is selected from the group consisting of 0 and real numbers 1 to 5 with the provision that when n equals 0, A is never hydrogen.

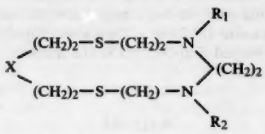
4,311,638

SILVER COMPLEXING AGENTS

Stanley M. Bloom, deceased, late of Waban, Mass. (by Arlene N. Bloom, executrix), and Krishna G. Sachdev, Beacon, N.Y., assignors to Polaroid Corporation, Cambridge, Mass.

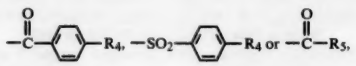
Division of Ser. No. 80,350, Oct. 1, 1979, Pat. No. 4,267,256.
This application Oct. 30, 1980, Ser. No. 202,295
Int. Cl.³ C07D *285/00, 291/02*
U.S. Cl. 260—330 **9 Claims**

1. A compound represented by the formula



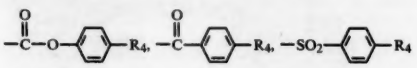
wherein X is selected from the group consisting of oxygen, sulfur and $—NR_3$;

R_1 and R_2 are the same or different and are H, alkyl, hydroxyalkyl, alkoxyalkyl,



provided that both R_1 and R_2 are not H, wherein R_4 is H, alkyl, alkoxy or $—NO_2$ and R_5 is H, alkyl, alkoxy or alkoxyalkyl; and

R_3 is H, alkyl, hydroxyalkyl, alkoxyalkyl,



or $—CH_2—CH=CH—R_6$, wherein R_6 is H, alkyl, cyano or

wherein R_7 is H or alkyl.

4,311,639

IMMUNOGENIC INTERFERON PEPTIDES

David J. Ganfield, Clementon, N.J.; Michael W. Hunkapiller, San Gabriel, Calif.; Ernest Knight, Jr., and Bruce D. Korant, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 25, 1980, Ser. No. 172,467
Int. Cl.³ C07C *103/52*; A61K *37/02*
U.S. Cl. 260—112.5 R **7 Claims**

1. An immunogenic peptide comprising the following amino acid sequence:

(X-Ser-Tyr-Asn-Leu-Leu-Gly-Phe-Leu-Gln-Arg-Ser-Ser-Asn-Phe-Gln-Y-Gln-Lys-Leu-Leu)$_n$

wherein:

X is selected from Met and Ser,

Y is selected from His and Cys, and

n is 1 to 12.

4,311,640
PEPTIDE, PROCESS FOR PREPARATION THEREOF AND USE THEREOF

Yoshio Kuroda, Takatsuki; Eiko Iguchi, Osaka; Masanobu Kohsaka, Sakai; Hatsuo Aoki, Ikeda; Hiroshi Imanaka, Osaka; Yoshihiko Kitaura, Suita; Osamu Nakaguchi, Toyonaka; Keiji Hemmi, Yawata; Matsuhiko Aratani, Awaji-Shimmachi; Hidekazu Takeno, Nara; Satoshi Okada, Osaka; Hirokazu Tanaka, and Masashi Hashimoto, both of Takarazuka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

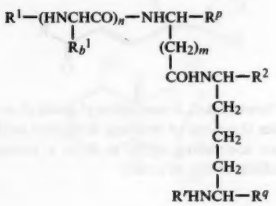
Filed Nov. 13, 1979, Ser. No. 93,523

Claims priority, application United Kingdom, Nov. 14, 1978, 44346/78; Jul. 31, 1979, 26705/79; Oct. 11, 1979, 35401/79; Oct. 15, 1979, 35730/79; Oct. 29, 1979, 36000/79

Int. Cl.[3] C07C *103/52;* C07G *7/00*

U.S. Cl. 260—112.5 R 12 Claims

1. A compound of the formula:

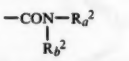


wherein

R^1 is acyl;

R_b^1 is hydrogen, methyl, isopropyl, hydroxymethyl, protected hydroxymethyl or benzyl;

R^2 is hydrogen, carboxy, protected carboxy, or a group of the formula:



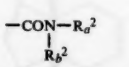
wherein R_a^2 is mono-or di-carboxy lower alkyl or ar(carboxy)lower alkyl whose aryl moiety may be substituted by hydroxy, R_b^2 is hydrogen or lower alkyl;

R^p and R^q are each hydrogen, carboxy, protected carboxy, with proviso that when one of R^2 and R^q is hydrogen, then the other is carboxy or protected carboxy;

R^r is hydrogen or amino protective group;

m is an integer 1 to 3; and

n is 1, provided that when R^1 is hydrogen, t-butoxycarbonyl or N-acetylmuramyl, R_b^1 is methyl, m is an integer 2 and n is an integer 1, then R^2 is hydrogen, protected carboxy or a group of the formula:



wherein R_a^2 is mono- or di-carboxy lower alkyl having 1 and 3 to 6, carbon atoms, α-carboxyethyl, ar(carboxy)lower alkyl whose aryl moiety may be substituted by hydroxy and R_b^2 is as defined above,

or its pharmaceutically acceptable salt.

4,311,641
CHROMIUM COMPLEXES OF MIXED AZO COMPOUNDS

Fabio Beffa, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

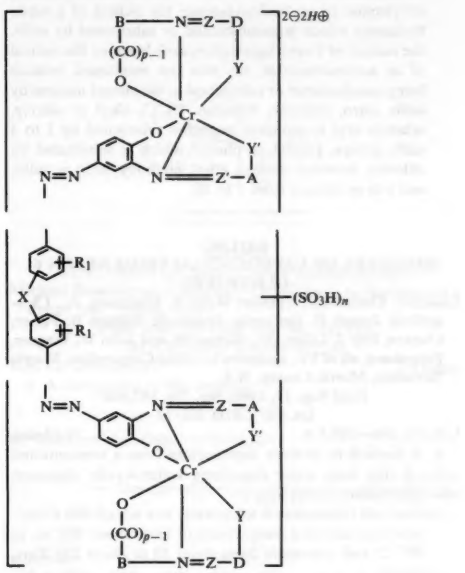
Filed Sep. 10, 1979, Ser. No. 74,206

Claims priority, application Switzerland, Sep. 20, 1978, 9845/78

Int. Cl.[3] C09B *45/06, 45/26;* C09D *45/48;* D06P *1/10*

U.S. Cl. 260—145 A 9 Claims

1. A chromium complex dye which, in the form of the free acid, has the formula



wherein

X is selected from the group consisting of a direct bond, methylene, C_1–C_5 alkylmethylene, phenylmethylene, 1,1-cyclohexylene, —O—, —S—, —NR′—, —SO—, —SO_2—, —CO—, —CO—CO—, —SO_2—NH—, —SO—NR′—SO_2—, —N=N—, —CH_2—CH_2— and —CH=CH—; R′ is hydrogen or low molecular alkyl; each of Z and Z′ independently is nitrogen or —CH—, p is 1 or 2, each of Y and Y′ independently is oxygen or —NR—, wherein R is hydrogen or C_1–C_5 alkyl, with the proviso that if Z or Z′ is —CH—, Y or Y′ must be oxygen, R_1 is hydrogen or sulfo, carboxy, halogen, C_1–C_5 alkyl or C_1–C_5 alkoxy, B is phenyl or naphthyl which is unsubstituted or substituted by sulfo, C_1–C_5-alkyl, C_1–C_5-alkoxy, C_1–C_5-alkylsulfonyl, sulfamoyl, C_1–C_5 N-alkyl- or N,N-dialkylsulfamoyl, chlorine, bromine, nitro, cyano, phenylazo, sulfophenylazo, sulfonaphthylazo, sulfophenylazo-phenyleneazo, or sulfonaphthylazophenyleneazo, A is, if Z′ is —CH—, o-phenylene which is unsubstituted or substituted by phenylazo, naphthylazo, phenylazo-phenyleneazo or naphthylazophenyleneazo, the phenyl or naphthyl groups being unsubstituted or substituted by sulfo, chlorine, bromine, nitro, methoxy methyl or ethyl, A—Y′ is, if Z′ is nitrogen, the radical of α- or β-naphthol which is unsubstituted or substituted by sulfo, the radical of 1-phenyl-3-methylpyrazol-5-one or the radical of acetoacetanilide, the two last-mentioned radicals being unsubstituted or substituted in the phenyl nucleus by sulfo, nitro, chlorine, bromine, C_1–C_5-alkyl or C_1–C_5-alkoxy.

D is, if Z is —CH—, the radical of 2-hydroxy-1-naphthaldehyde or 1-hydroxy-2-naphthaldehyde or the o-phenylene radical which is unsubstituted or once or twice substituted by C_1–C_5-alkyl, halogen, sulfo, phenylazo, naphthylazo, phenylazophenyleneazo or naphthylazophenyleneazo, the phenyl or naphthyl groups being unsubstituted or substituted by sulfo, halogen, nitro, methoxy methyl or ethyl,

D is, if Z is nitrogen, the radical of a phenol which couples in ortho-position to Y and which is unsubstituted or substituted by hydroxy, C_1–C_5 alkyl or C_1–C_5 alkoxy, the radical of a naphthol which is unsubstituted or substituted by amino, sulfo, chlorine, C_1–C_5-alkanoylamino, C_1–C_5-alkylsulfonylamino, C_1–C_5 alkoxycarbonylamino, aroylamino or arylsulfonylamino; the radical of a naphthylamine which is unsubstituted or substituted by sulfo, the radical of 1-aryl-3-methylpyrazol-5-one or the radical of an acetoacetanilide, the two last mentioned radicals being unsubstituted or substituted in the phenyl nucleus by sulfo, nitro, chlorine, bromine, C_1–C_5 alkyl or alkoxy, wherein aryl is naphthyl, naphthyl substituted by 1 to 3 sulfo groups, phenyl or phenyl which is substituted by chlorine, bromine, methyl, ethyl, methoxy, nitro or sulfo, and n is an integer from 1 to 10.

4,311,642

RECOVERY OF CAPROLACTAM FROM NYLON 6 OLIGOMERS

Lamberto Crescentini, Chester; Webb B. Blackman, Jr., Chesterfield; Joseph D. DeCaprio, Hopewell; William B. Fisher, Chester; Roy J. Lilley, Jr., Richmond, and John W. Wagner, Petersburg, all of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 17, 1980, Ser. No. 187,864

Int. Cl.³ C07D *201/12*

U.S. Cl. 260—239.3 A **18 Claims**

1. A method to recover caprolactam from a concentrated nylon 6 chip wash water containing water, cyclic oligomer, and caprolactam comprising

feeding said concentrated wash water to a wiped-film evaporator operated at a temperature of from about 200° C. to 300° C. and a pressure from about 10 to about 250 Torr, thereby

separating said wash water into (a) an overhead stream of water and caprolactam and (b) a bottom stream of caprolactam and cyclic oligomers, then

recovering the caprolactam from the overhead stream, said bottoms stream containing only carrier lactam to increase fluidity of the oligomers and make the stream easier to handle.

4,311,643

PROCESS FOR PRODUCING METAL CORRINOIDS

Volker Koppenhagen, Braunschweig-Stöckheim, Fed. Rep. of Germany; Gerhard Schlingmann, Berkeley, Calif.; Bernd Dresow, Brunswick, and Ortrud Ebelmann, Kissenbrück, both of Fed. Rep. of Germany, assignors to Gesellschaft fur Biotechnologische Forschung mbH, Braunschweig-Stöckheim, Fed. Rep. of Germany

Filed Mar. 4, 1980, Ser. No. 127,366

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1979, 2908670

Int. Cl.³ C09B *47/00*

U.S. Cl. 260—314 **12 Claims**

1. Process for producing red metal corrinoids, consisting essentially of the steps of

(a) reacting yellow metal-free c-lactam-at-the-B-ring-corrinoids having main absorptions λ_{max} of 480 and 290 nm in a liquid medium with complex-forming metal ions to give yellow metal-containing corrinoids, and

(b) treating the metal corrinoids formed with alkali.

4,311,644

METHOD FOR PREPARING 10,10-DIFLUORO PROSTACYCLIN INTERMEDIATES AND NEW COMPOUNDS PRODUCED THEREBY

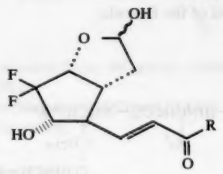
Jerome L. Moniot, Richboro, Pa.; Rita T. Fox, Princeton, N.J.; Peter W. Sprague, Pennington, N.J., and Martin F. Haslanger, Lambertville, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 30, 1981, Ser. No. 230,133

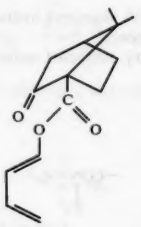
Int. Cl.³ C07D *307/935*

U.S. Cl. 260—346.22 **8 Claims**

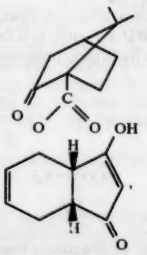
1. A method for preparing 10,10-Difluoroprostacyclin intermediates of the structure



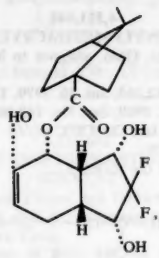
wherein R is lower alkyl, lower alkenyl, aralkyl or cycloalkyl, which includes the steps of reacting ketopinic acid or its acid halide with an acetylating agent to form a ketopinoyl diene ester intermediate of the structure



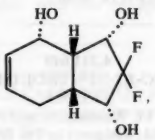
reacting the ketopinoyl diene ester with a cyclopentendione in a Diels-Alder reaction to form the Diels-Alder chiral ester adduct having the structure



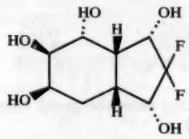
reacting the chiral ester with a fluorinating agent and then reacting the fluorinated chiral ester with a reducing agent to form the corresponding chiral ester diol of the structure



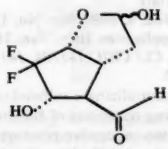
reacting the chiral ester diol with a base in the presence of an alcohol to form the chiral triol of the structure



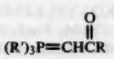
reacting the chiral triol with a hydroxylating agent to form the pentol of the structure



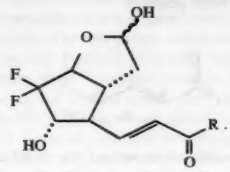
reacting the pentol with a ring cleaving agent to form the difluoro dihydroxy prostacyclin of the structure



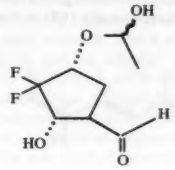
and subjecting the above prostacyclin derivative to a Wittig reaction by reacting same with a phosphonio compound of the structure



wherein R and R′ are the same or different and are lower alkyl, to form the difluoro dihydroxy prostacyclin intermediate of the structure



8. A prostacyclin intermediate having the structure



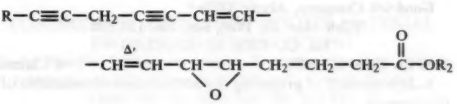
4,311,645

SYNTHESIS OF SRS-ACTIVE COMPOUNDS

Michael Rosenberger, Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 24, 1980, Ser. No. 133,180
Int. Cl.³ C07D *303/42, 303/38*
U.S. Cl. 260—348.61 **2 Claims**

1. A compound of the formula



wherein

R is $CH_3—CH_2—CH_2—CH_2—CH_2$; and R_2 is lower alkyl and Δ' designates a trans configuration across the double bond

and pharmaceutically acceptable salts thereof where R_2 is hydrogen.

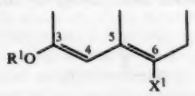
4,311,646

PROCESS FOR THE PREPARATION OF 4,6-DIEN-3-ONE STEROIDS

Issei Nitta, Machida; Toshio Haruyama, Sagamihara, and Shinya Inoue, Yamato, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Sep. 24, 1980, Ser. No. 190,223
Claims priority, application Japan, Oct. 12, 1979, 54-131511
Int. Cl.³ C07J *7/00*
U.S. Cl. 260—397.4 **8 Claims**

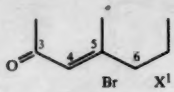
1. In a process for preparing a 4,6-dien-3-one steroid comprising the steps of: reacting a steroid enolic ether having partial structural formula (I) at the 3,4,5,6-position of rings A and B thereof:



(I)

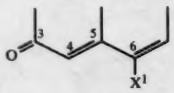
wherein X^1 is hydrogen, fluorine, chlorine or bromine and R^1 is an alkyl having 1 to 3 carbon atoms, with a halogenating agent capable of providing a positive bromine ion to brominate

the ether into a 6-bromosteroid having partial structural formula (II) at the same position:



(II)

wherein X^1 is as defined above and one of X^1 and Br is in the α-configuration and the other is in the β-configuration, and reacting the reaction mixture from the brominating step directly with a lithium halide and an inorganic carbonate to effect dehydrobromination and to give a 4,6-dien-3-one steroid having partial structural formula (III) at the same position:



(III)

wherein X^1 is as defined above, the improvement comprising conducting the bromination step in a water-containing organic solvent which is substantially free from acetic acid and sodium acetate and conducting the dehydrobromination step in a medium which contains dimethylformamide or N-methylpyrrolidone and 1 to 9% by volume of water.

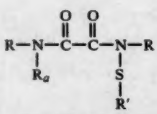
4,311,647

PROCESS FOR PREPARATION OF (HYDROCARBONTHIO)OXAMIDES

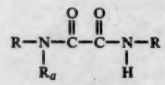
Dwight W. Chasar, Northfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 31, 1980, Ser. No. 135,598
Int. Cl.³ C07C *83/10, 103/10*
U.S. Cl. 260—453 RW **6 Claims**

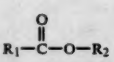
1. In a method of preparing (hydrocarbonthio) oxamides of the formula



wherein R and R_a are hydrogen or are selected from the group consisting of alkyl, aryl, aralkyl, alkaryl, cycloalkyl radicals containing 1 to 18 carbon atoms and —SR′, and R′ is a hydrocarbon radical containing 1 to 24 carbon atoms by reacting together a hydrocarbon sulfenyl chloride with an oxamide of the formula



in the presence of a tertiary amine and an organic solvent, improvement comprising selecting said solvent from liquid water insoluble aliphatic esters having the formula



wherein R_1 is H, methyl, ethyl, propyl, isopropyl, n-butyl, isobutyl, sec-butyl, t-butyl, pentyl and phenyl; R_2 is methyl, ethyl, propyl, isopropyl, n-butyl, iso-butyl, sec-butyl, t-butyl, pentyl and α-alkoxy ethyl wherein the alkoxy is methoxy or ethoxy.

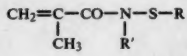
4,311,648

N-(SULFENYL) METHACRYLAMIDES

Eiichi Morita, Copley, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 62,265, Jul. 30, 1979. This application May 12, 1980, Ser. No. 148,066
Int. Cl.³ C07C *83/10*
U.S. Cl. 260—453 RW **10 Claims**

1. A compound of the formula



in which R is selected from the group consisting of primary or secondary alkyl of 1–20 carbon atoms, benzyl, cycloalkyl of 5–12 carbon atoms, phenyl or mono-, di-, or tri-substituted phenyl wherein the substituents are lower alkyl, lower alkoxy or halo, and R′ is phenyl or —SR.

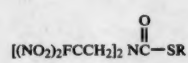
4,311,649

N,N-BIS(2-FLUORO-2,2-DINITROETHYL)CARBAMATE ESTERS

William H. Gilligan, Ft. Washington, and Michael E. Sitzmann, Adelphi, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 28, 1980, Ser. No. 210,981
Int. Cl.³ C07C *155/02*
U.S. Cl. 260—455 A **4 Claims**

1. A thiolcarbamate of the formula



wherein R is selected from the group consisting of methyl, ethyl, and n-propyl.

4,311,650

MULTI-STAGE NEUTRALIZATION OF SULFATED COMPOUNDS

Giovanni Moretti, Milano San Felice, Italy, assignor to Ballestia Chimica, S.p.A., Italy

Filed Jun. 4, 1980, Ser. No. 156,422
Claims priority, application Italy, Jun. 15, 1979, 12643 A/79
Int. Cl.³ C07C *141/04, 141/08*
U.S. Cl. 260—458 R **8 Claims**

1. A process for neutralizing a sulfated compound, comprising feeding decreasing quantities of the compound to be neutralized to at least two successive reactors in parallel, feeding to the first reactor substantially the entire quantity of neutralizing agent necessary and sufficient to neutralize the compound, and feeding the output of each reactor to the next reactor in series.

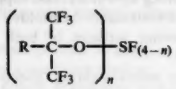
4,311,651

FLUOROALKOXYSULFUR FLUORIDES

William J. Middleton, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 9, 1980, Ser. No. 148,209
Int. Cl.³ C07C *143/00, 147/00*
U.S. Cl. 260—543 H **13 Claims**

1. Fluoroalkoxysulfur fluorides of the formula



wherein R is selected from H, CH_3, CF_3 and C_2F_5, and n is 1 or 2.

4,311,652

ARBUZOV REACTIONS EMPLOYING AN ALIPHATIC SOLVENT

Alan Abramson, White Plains, and Edward D. Weil, Hastings-on-Hudson, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed May 28, 1980, Ser. No. 154,170
Int. Cl.³ C07F *9/40*
U.S. Cl. 260—969 **12 Claims**

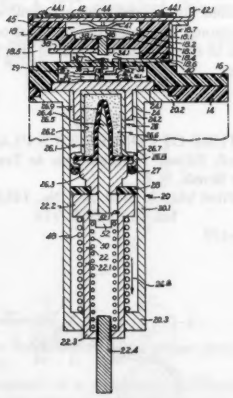
1. A novel process for the rearrangement of a phosphite to the phosphonate product comprising conducting the rearrangement process in an essentially aliphatic solvent which is miscible with the reactants at the reaction temperature, but substantially immiscible with the phosphonate product at lower temperatures.

4,311,653

FAST IDLE CARBURETOR SYSTEM

Osami Kushida, Kawagoe, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 10, 1977, Ser. No. 850,166
Int. Cl.³ F02M *1/12*
U.S. Cl. 261—39 A **1 Claim**



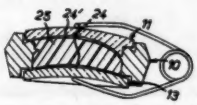
1. In a carburetor having throttle plate means movable for regulating speed of operation of an internal combustion engine and means biasing the throttle plate means toward a low idle position for normally maintaining the engine at a low idle speed, fast idle means movable between a first position holding the throttle plate means in a fast idle position against said bias to maintain the engine at a relatively faster idle speed during engine warm-up after starting and a second position permitting the throttle plate means to move to said low idle position in response to said bias, chamber means, piston means movable in the chamber means for moving the fast idle means from said first to said second position thereof, a thermally expansible material in the chamber means responsive to heating for moving the piston means to move the fast idle means to the second position thereof, a source of electrical power, and electrical heater means energizeable from said power source for heating said thermally expansible material, characterized in that, said heater means comprise first and second electrical resistance heater elements disposed in heat-transfer relation to said thermally expansible material, terminal means electrically connect said first heater element to said power source on starting of the engine for heating said material, thermally responsive switch means are operable above a selected ambient temperature to electrically connect said second heater element to said power source for accelerating heating of said material when the ambient temperature is above said selected temperature, a thermally and electrically conductive metal cup receives said chamber means therein, said thermally expansible material undergoes a change of physical state and a rapid expansion associated with said change of state for promptly moving said fast idle means to the second position thereof when said material is heated to a first temperature relatively higher than said selected ambient temperature, said heater elements have a positive temperature coefficient of resistivity and are adapted to undergo a sharp increase in resistivity for limiting self-heating of the elements when heated to a temperature relatively higher than said first temperature, said heater elements are embodied in ceramic disc means of a material of positive temperature coefficient of resistivity having one side thereof secured in electrically and thermally conductive relation to said cup, and a casing has an electrically insulating portion securing said terminal means, switch means, and cup in assembled relation and has an electrically conducting portion engaging said cup to electrically connect said one side of said disc means to electrical ground.

4,311,654

CONTROLLING RELEASE OF MOLDED MATERIAL FROM MOLD DURING CURING

Denis Blandin, Villiers-sur-Marne, France, assignor to Essilor International "Cie Generale d'Optique", Creteil, France

Filed Feb. 15, 1980, Ser. No. 121,912
Claims priority, application France, Feb. 20, 1979, 79 04308
Int. Cl.³ B29D *11/00*
U.S. Cl. 264—2.3 **6 Claims**



6. A method of moulding materials requiring heat treatment for setting or curing in which a mould is used having a plurality of mould components with moulding surfaces together defining a moulding cavity, said method comprising the steps of: forming at least part of one of the mould components of fusible material, the fusible material extending along at least part of the associated moulding surface and outwardly therefrom the fusible material having a drop point or softening point which occurs at a predetermined temperature during heat treatment whereby premature release or separation occurs without jeopardizing the ultimate qualities of the moulded material; filling the moulding cavity with the moulding material; applying heat to said moulding material in the mould to set or cure the moulding material, and wherein when the temperature of the fusible material reaches its drop point or softening point the moulded material is effectively released from the corresponding part of said moulding surface of the one mould component formed in part of fusible material; continuing the heat treatment until completed; and removing the moulded article from the mould.

4,311,655
INOMER THERMOFORMING

Bahram Siadat, Columbia, Md., assignor to W. R. Grace & Co., New York, N.Y.

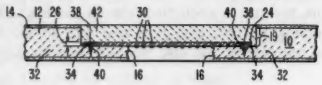
Filed Mar. 31, 1980, Ser. No. 135,912
Int. Cl.³ B29C 1/00; H05B 9/00; C08J 7/08
U.S. Cl. 264—22 14 Claims

1. A method of imparting processability to an ionically cross-linked polymer comprising subjecting a water insoluble, ionically cross-linked polymer mass having at least about 0.1 mole percent metal-ionic groups therein to radio frequency energy of sufficient frequency, power and time to cause dissociation among the ionic cross-link groups contained therein while maintaining the polymer mass at a temperature below its degradation temperature.

4,311,656
METHOD FOR REPAIRING EXTENSIVE DAMAGE TO PLASTERBOARD WALL AREAS

William A. Spriggs, 128 Toldeo La., Willingboro, N.J. 08046

Filed Aug. 21, 1980, Ser. No. 180,217
Int. Cl.³ B32B 35/00
U.S. Cl. 264—36 12 Claims



1. A method for repairing extensive damage to plasterboard wall areas comprising:

(a) cutting the surface of the plasterboard material in an area defined surrounding the damaged area to a depth sufficient to perforate the surface layer thereof;

(b) removing the surface layer of plasterboard material in the defined area surrounding the damage area;

(c) sanding the defined area around the damaged area to a predetermined depth less than the complete thickness of the plasterboard material itself;

(d) placing a plate member, defining a plurality of apertures therein, into the defined area extending completely over the damaged area with attachment areas thereof extending over the undamaged area within the defined area, the plate member being of a thickness less than the predetermined depth of said sanding;

(e) securing the attachment area of the plate area of the undamaged area of the plasterboard material within the defined area;

(f) placing wet plaster to a depth greater than the predetermined depth into the defined area over the undamaged area of the plasterboard and over the plate member including through perforations defined therein to facilitate securement of the plaster material thereto upon drying;

(g) drying of the wet plaster placed within the damaged areas; and

(g) sanding the dried plaster within the defined area to a level approximately equal to the surrounding plasterboard.

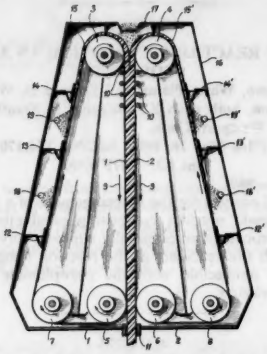
4,311,657
METHOD AND APPARATUS FOR FABRICATING SHEETS OF THERMOPLASTIC MATERIAL

Aloysius W. M. Koster, Kerkeindweg 10, 5582 HD Aalst-/Waalre, Netherlands

Filed Aug. 28, 1980, Ser. No. 181,956
Claims priority, application Netherlands, Aug. 28, 1979, 7906467
Int. Cl.³ B29D 7/14
U.S. Cl. 264—171 8 Claims

1. A method of manufacturing sheets of thermoplastic material, comprising disposing a pair of endless belts with coacting runs spaced apart to form between them a molding space with said coacting runs of the belt moving downwardly and return runs of said belt moving upwardly, and supplying at least most of the thermoplastic material to be molded in said mold space onto upwardly moving surfaces of both of said upwardly moving return runs.

7. Apparatus for manufacturing sheets of thermoplastic material, comprising a pair of endless belts having coacting opposed spaced vertical downwardly moving runs defining between them a mold space, upper reversing wheels about

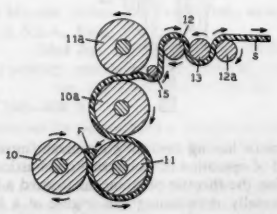


which said belts pass when moving toward said mold space, means for supplying material to said belts before said belts reach said mold space, scrapers for lifting thermoplastic material from the belts after the belts have traversed a portion of the periphery of the reversing wheels and before the belts have entered the mold space, and means below said scrapers for supplying additional thermoplastic material between the belts and the layers of thermoplastic material that have been lifted by the scrapers.

4,311,658
MANUFACTURE OF CONTINUOUS PLASTIC SHEETS

Frank D. Nicoll, Edison, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed May 2, 1980, Ser. No. 145,910
Int. Cl.³ B29D 7/14
U.S. Cl. 264—175 13 Claims



1. In a process for the manufacture of a continuous sheet or film of plastic material on a calender having at least two rolls which comprises the steps of:

a. fluxing a plastic composition at an elevated temperature into a soft mass;

b. continuously forming said mass into a flexible sheet or film on a heated calender roll;

c. continuously stripping said sheet or film from said calender roll by contacting said sheet or film with stripping means comprising at least one endless, moving second surface acting cooperatively with, but spaced apart from,

said calender roll; and, without subjecting said sheet or film to an additional sheet- or film-forming step at elevated temperature, or to further contact with a roll of said calender;

d. cooling said sheet or film to ambient temperature while conveying it to a receiving station;

the improvement which comprises making rolling contact between said stripping means and the side of said sheet or film which was in contact with said calender roll, whereby a plastic sheet or film having a predetermined degree of residual strain is obtained.

8. In apparatus for the manufacture of a continuous sheet or film of plastic material comprising, in cooperating combination, a calender having at least two rolls; stripping means for removing said sheet or film from said calender after said sheet or film has passed through the final nip of said calender, cooling means, a receiving station for said sheet or film, and conveying means for conveying said sheet or film from said stripping means without making further contact with said calender rolls through said cooling means to said receiving station; the improvement wherein said stripping mean comprises at least one driven roll having its axis parallel to, rotating in the same direction as, and spaced apart from the roll of said calender from which said sheet or film is stripped, said stripping means being positioned to make rolling contact with the side of said sheet or film which was in contact with the calender roll from which it is stripped.

4,311,659
PROCESSES FOR THE MANUFACTURE OF ORGAN PROSTHESES

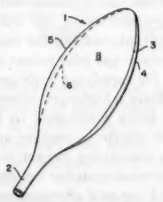
Pierre Rey, Thorigny; Jacqueline Leandri, Paris, and Clement Abbou, Fontenay-sous-Bois, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Division of Ser. No. 43,667, May 30, 1979, which is a division of Ser. No. 784,377, Apr. 4, 1977, abandoned. This application Sep. 7, 1979, Ser. No. 73,319

Claims priority, application France, Apr. 5, 1976, 76 09794; Mar. 10, 1977, 77 07091

Int. Cl.³ B29H *3/04*

U.S. Cl. 264—221 **15 Claims**



1. A process for manufacture of an organ prosthesis, comprising the steps of:

(a) forming a support of a completely eliminable material selected from the group of wax, ceresin or a sol selected from the group consisting of gelose and gelatin in solution which, on cooling, forms a gel, in the shape of the organ prosthesis, said support being formed by molding the completely eliminable material in a removable mold whose surfaces are devoid of any rough or uneven areas and then releasing the molded completely eliminable material from said removable mold;

(b) depositing on said support preformed in the shape of the organ prosthesis a sol selected from the group consisting of gelose and gelatin which, no cooling, forms a gel having a surface state approximately the same as the liquid-air interface of gelose or gelatin in solution at its surface not adjacent the support;

(c) cooling said sol to form said gel;

(d) depositing a hardenable flexible material compatible with body fluids and tissues on said gel;

(e) hardening said hardenable flexible material, thereby forming said organ prosthesis of a hardened flexible material, said hardened flexible material having a surface state adjacent said gel that is devoid of roughness, whereby formation of concentrations and deposits, during use of the organ prosthesis, due to roughness is avoided; and

(f) removing said organ prosthesis from said support; said removing including eliminating said gel and support from the organ prosthesis, whereby said gel aids in forming the surface state of hardened flexible material devoid of roughness and eliminating said gel and support acts to remove the organ prosthesis from the support.

4,311,660
HEAT-TREATING POLYOLEFIN FILMS

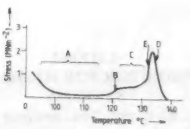
Peter J. Barham, Southmead; Jeffrey A. Odell, Knowle, and Frank M. Willmouth, Royston, all of England, assignors to Imperial Chemical Industries Limited, London, England

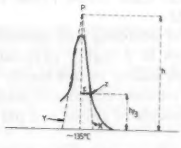
Filed Jul. 16, 1980, Ser. No. 170,834

Claims priority, application United Kingdom, Aug. 7, 1979, 27412/79

Int. Cl.³ B29C *25/00*

U.S. Cl. 264—342 RE **7 Claims**





1. A method of heat-treating a biaxially oriented polyolefin film comprising constraining the film against shrinkage, heating the constrained film within a period not exceeding 5.3T seconds to a treatment temperature in a range of from (T−15) to (T+10)°C., wherein T°C. is the melting temperature of the polyolefin, and thereafter cooling the treated film to a temperature not exceeding (T−80)°C.

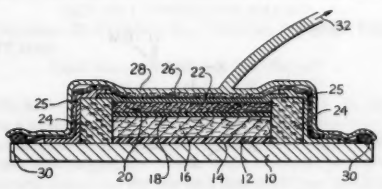
4,311,661
RESIN IMPREGNATION PROCESS

Raymond J. Palmer, Newport Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed May 5, 1980, Ser. No. 146,769

Int. Cl.³ B29D *3/02*

U.S. Cl. 264—510 **24 Claims**



1. The process for producing a resinfiber composite which comprises

(a) forming an assembly comprising a curable resin film, a

fiber reinforcement layer, a porous parting film and a bleeder layer, on the surface of a mold, said curable resin film being positioned on the mold surface, said fiber reinforcement layer being positioned over said resin film, said porous parting film being positioned over said fiber reinforcement layer, and said bleeder layer being disposed over said parting film,

(b) placing said assembly under a vacuum,

(c) initially heating the assembly while under said vacuum to a temperature sufficient to cause said resin to flow and to impregnate said fiber reinforcement layer, pass through said parting film and impregnate said bleeder layer, the amount of resin employed being sufficient to provide complete saturation of said bleeder layer and therefore provide essentially complete and uniform saturation of resin into said fiber reinforcement layer, and

(d) further heating said assembly at a sufficient temperature and pressure to effect final curing of the resin impregnated fiber reinforcement layer and to form a resin impregnated fiber reinforcement composite.

4,311,662

CORROSION INHIBITOR FOR HIGHLY OXYGENATED SYSTEMS

Thomas J. Bellos, Kirkwood, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Feb. 13, 1978, Ser. No. 877,055

Int. Cl.³ C23F *11/04, 11/06, 11/12, 11/16*

U.S. Cl. 422—12 **5 Claims**

1. A process of inhibiting both general and pitting corrosion of ferrous alloys in a highly oxygenated corrosive system which comprises adding to said highly oxygenated corrosive system a minor amount, effective to inhibit corrosion, of phosphorylated oxyalkylated polyol at a pH of 5.0 or higher.

4,311,663

α-1,4-THIAZINE ALKANEPHOSPHONIC ACIDS AS CORROSION INHIBITORS

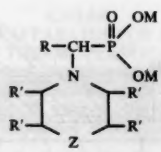
Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 932,257, Aug. 9, 1978, Pat. No. 4,264,767. This application Oct. 2, 1980, Ser. No. 193,223

Int. Cl.³ C23F *11/04, 11/16*

U.S. Cl. 422—12 **8 Claims**

1. A process of inhibiting corrosion of metals exposed to a corrosive liquid medium which comprises adding to said corrosive liquid medium an effective amount of a compound of the formula



where R is a member of the group selected from the group consisting of alkyl, alkenyl, cycloalkyl, aryl, alkaryl, aralkyl and hydroxyphenyl, and R′ is hydrogen or alkyl, Z is S, SO or SO_2, and M is a hydrogen or a salt moiety.

4,311,664

FLAME-PHOTOMETRIC DETECTOR BURNER OF GAS CHROMATOGRAPH

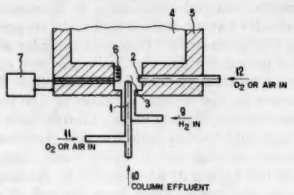
Marek Zaremba; Czeslaw Rozycki, both of Warsaw, and Rafal Staszewski, Gdansk-Wrzeszcz, all of Poland, assignors to Wojskowy Instytut Chemii I Radiometrii, Warsaw, Poland

Continuation-in-part of Ser. No. 856,163, Nov. 30, 1977, abandoned. This application Apr. 11, 1978, Ser. No. 895,522

Claims priority, application Poland, Dec. 8, 1976, 194255

Int. Cl.³ G01N *27/62, 31/12*

U.S. Cl. 422—54 **5 Claims**



1. A flame photometric detector in combination with a flame photometric detector burner and a gas chromatrographic column, said detector having a housing including a combustion chamber, said housing allowing maintenance of a hydrogen atmosphere inside the chamber and having detection means for measuring electromagnetic radiation emitted during analysis of components from said chromatographic column, said flame photometric detector burner comprising: a housing with bottom and side walls, cavity means defined in said bottom wall, flame ignition means within said cavity means, first and second nozzle means connected to said housing and communicating with the interior of said cavity means, said first and second nozzle means being disposed with respective axes in a single plane and each nozzle means terminating upstream of the downstream end of said cavity means, said first nozzle means extending through said bottom wall of said housing and being spaced from a vertical wall of said cavity means to form an annular space, said second nozzle means extending through said vertical wall of said cavity means and having its outlet end terminating just downstream of the outlet end of said first nozzle means without intersecting the vertical axis of said first nozzle means, hydrogen gas inlet means surrounding said first inlet means, means for supplying hydrogen gas to said hydrogen inlet means to form a hydrogen atmosphere in said cavity said nozzle means being positioned to secure mutual flame jump over from one nozzle to another and vice versa, means for supplying a gas containing oxygen to each of said nozzle means, and said chromatographic column having means for supplying a sample from said chromatographic column, via a carrier gas, to said first nozzle means.

4,311,665

SEPARATION AND ISOLATION OF CONJUGATED AND UNCONJUGATED BILIRUBIN

Tai-Wing Wu, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 56,585, Jul. 11, 1979, abandoned. This application Dec. 10, 1979, Ser. No. 101,663

Int. Cl.³ C07D *207/00*; G01N *33/72*

U.S. Cl. 422—56 **21 Claims**

1. A method for the separation and isolation of conjugated bilirubin (B_c) and unconjugated bilirubin (B_u) from an aqueous liquid containing B_c, B_u, or a mixture of B_c and B_u, said method comprising:

(a) contacting together said liquid and an interactive mordant having binding sites for bilirubin to mordant said B_c, B_u, or mixtures of B_c and B_u, said mordant comprising at least one moiety having a hydrophobic organic matrix containing a charge-bearing cationic group;

(b) separating the mordanted B_c and/or B_u of step (a) from said liquid; and

(c) treating the mordanted B_c and/or B_u of step (b) in an aqueous medium with a chaotropic agent at least slightly soluble in said medium to release B_c and/or B_u from said mordant.

21. An article of manufacture for the assay of bilirubin contained in an aqueous liquid, said article comprising a wet or dry matrix, and isolated conjugated bilirubin having a purity of 75% or higher as determined by quantitative nuclear magnetic resonance and gravimetric analysis.

4,311,666

APPARATUS FOR CONTROLLING THE DEGREE OF CAUSTICIZATION IN THE PREPARATION OF WHITE LIQUOR FROM THE CHEMICALS RECOVERED FROM BLACK LIQUOR

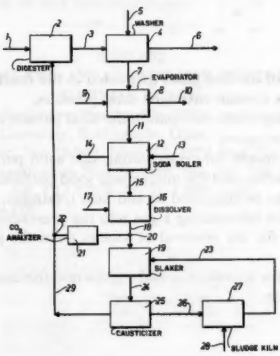
Bengt G. Hultman, and Erik A. Berglund, both of Domsjo, Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Division of Ser. No. 52,523, Jun. 27, 1979, Pat. No. 4,236,960. This application Feb. 11, 1980, Ser. No. 117,893

Claims priority, application Sweden, Jul. 18, 1978, 7807910

Int. Cl.³ D21C 7/12

U.S. Cl. 422—62 **9 Claims**



1. A chemical recovery system for use in the sulfate pulping process for the preparation of sulfate pulp from lignocellulosic material comprising, in combination, in fluid flow connection and in flow sequence in the order stated:

(1) an evaporator for concentration of black liquor with application of heat;

(2) a combustor vessel for combustion of concentrated black liquor, and conversion of the residual combusted chemicals to a smelt;

(3) a dissolver for dissolving chemical smelt from the combustor in water, forming green liquor;

(4) a slaker for mixing green liquor with calcium oxide;

(5) a causticizer for conversion of sodium carbonate to sodium hydroxide in green liquor by reaction with the calcium oxide to form a mixture of white liquor and calcium carbonate sludge;

(6) means for withdrawing the sludge;

(7) means for withdrawing white liquor from the causticizer; and

(8) a carbon dioxide analyzer interposed to receive and analyze samples of green liquor from the green liquor between the slaker and the causticizer, and to receive and analyze samples of white liquor withdrawn from the causticizer, said carbon dioxide analyzer comprising means for oxidizing and thus inhibiting gas liberation from other substances present in the samples of green or white liquor and liberating gases in acidified solution; means for acidifying the oxidized green liquor and white liquor samples to liberate carbon dioxide gas; means for collecting the liberated carbon dioxide gas and means for determining the amount of liberated carbon dioxide gas in terms selected from (a) the pressure of carbon dioxide liberated (b) the volume of carbon dioxide liberated (c) the flow of carbon dioxide liberated (d) infra-red photometric analysis of the carbon dioxide liberated and (e) heat-conductivity of the carbon dioxide liberated; the amount being a function of carbonate ion concentration.

4,311,667

DELIVERING APPARATUS

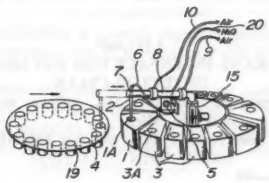
Nagahiro Gocho, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Apr. 15, 1980, Ser. No. 140,567

Claims priority, application Japan, Apr. 19, 1979, 54/48197

Int. Cl.³ G01N 1/14, 35/06

U.S. Cl. 422—64 **8 Claims**



1. In an improved apparatus comprising a delivery device including a single probe and being operative to suck at least one kind of liquid such as a plurality of reagents, samples or the like, from respective vessels into the probe and deliver the liquid thus sucked from the same probe into reaction vessels, the improvement comprises: providing said probe to be movable along a given moving path, said vessels containing said liquids to be delivered being fixedly arranged at a plurality of predetermined sucking positions along the moving path of said probe and in which said reaction vessels are movable along a path which is crossed with the moving path of said probe at a discharging position, and in which provision is made of means for locating said probe at any sucking position to suck a given amount of liquid contained in the vessel situated at the relevant sucking position and then moving the probe into said discharging position to discharge the sucked liquid into a reaction vessel situated at the discharging position.

4,311,668

MICRO CLEANUP AND CONCENTRATION APPARATUS FOR TRACE RESIDUE ANALYSIS BY GAS LIQUID CHROMATOGRAPHY

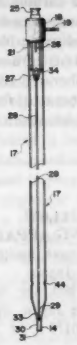
John Solomon, 29 Waterford Bay, Winnipeg, Manitoba, Canada (R3T 1H6)

Filed Aug. 28, 1980, Ser. No. 182,017

Int. Cl.³ G01N 31/08

U.S. Cl. 422—70 **20 Claims**

1. In a micro cleanup and concentration apparatus for trace residue analysis by gas liquid chromatography which includes a liquid chromatographic column and a filament concentrator operatively connected thereto such that fluid from the column will be fed to the concentrator; the improvement wherein the concentrator comprises in combination an elongated, substantially vertically situated cylindrical jacket, an elongated substantially vertical filament located within said jacket, means for

freely suspending said elongated filament within said jacket and means adjacent the lower end of said jacket for centralizing and stabilizing the distal lower end of said elongated filament.

4,311,669

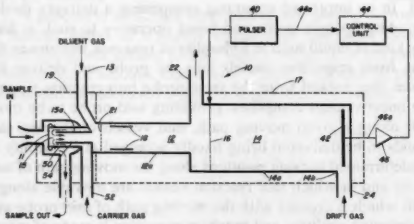
MEMBRANE INTERFACE FOR ION MOBILITY DETECTOR CELLS

Glenn E. Spangler, Baltimore, Md., assignor to The Bendix Corporation, Southfield, Mich.

Filed Aug. 21, 1980, Ser. No. 180,219

Int. Cl.³ G01N *27/66, 21/31*

U.S. Cl. 422—98 **7 Claims**



1. In an ion mobility detector wherein a sample gas or vapor and carrier gas are injected into a reaction region thereof, a membrane interface separating the sample source from the carrier gas comprising:

a membrane having a face exterior to said ion mobility detector in communication with said sample source and an interior face which communicates with said reaction region; and,

passage means for injecting said carrier gas onto said interior face and thence into said reaction region.

4,311,670

FLUIDIZED BED REACTOR SYSTEM

Jorma J. Nieminen, Varkaus, and Engström Folke, Karhula, both of Finland, assignors to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Division of Ser. No. 970,457, Dec. 18, 1978, Pat. No. 4,244,779, which is a continuation-in-part of Ser. No. 820,575, Aug. 1, 1977, abandoned. This application Jan. 4, 1980, Ser. No. 109,604

Claims priority, application Finland, Sep. 22, 1976, 762695; Feb. 21, 1977, 770546; Apr. 20, 1977, 771247

Int. Cl.³ B01J *8/24, 8/32*

U.S. Cl. 422—145 **2 Claims**

1. An apparatus for heat treatment of a material in a fluidized bed which consists essentially of:

(1) means defining a single fluidized bed reactor in which the heat treatment of said material is carried out;

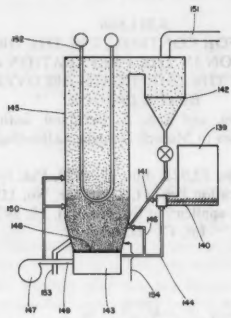
(2) a prereactor, of the non-fluidized bed type, for preheating the material to be subjected to said heat treatment;

(3) means for transferring the preheated material from the prereactor to the lower part of the reactor;

(4) first inlet means for air located in the bottom part of the reactor;

(5) at least one second inlet means for secondary air located at the level above said first inlet means for said air;

(6) outlet means located in the upper part of the reactor for removal of the flue gases generated in the reactor, which flue gases contain entrained solid particles;



(7) separating means to separate the solid particles entrained in said flue gases;

(8) conduit means for recirculating said solid particles into the prereactor and for mixing said solid particles with the material to be subjected to said heat treatment;

(9) means for introducing a gas into the prereactor;

(10) means for the removal of vapors from the prereactor and

(11) means for introducing said vapors into the upper part of the reactor.

4,311,671

SYNTHESIS REACTOR

Alan Notman, Norton, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Sep. 9, 1980, Ser. No. 185,440

Claims priority, application United Kingdom, Sep. 14, 1979, 31877/79

Int. Cl.³ B01J *8/04*

U.S. Cl. 422—148 **10 Claims**

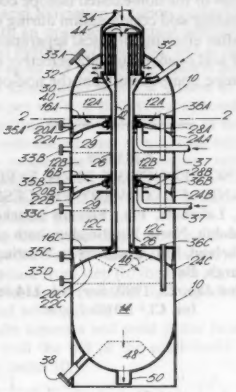
1. A reactor for catalytic gas reactions comprising:

a plurality of series connected catalyst beds, each disposed one above the other, in a reactant flow path;

each said catalyst bed having an exterior cylindrical form with a vertical axis and a height not greater than its overall diameter, and being defined on its underside by a substantially flat grid supported by a dished plate having peripheral mechanical connection to a downward extension of the cylinder walls;

a heat exchanger disposed downstream, in the reactant flow

path, of the downstream-most of said plurality of catalyst beds; and

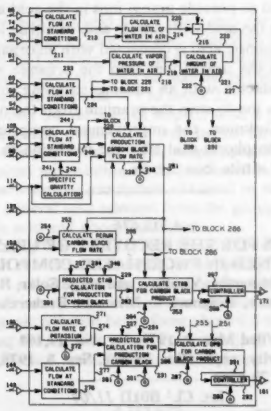


a further catalyst bed disposed downstream, in the reactant flow path, of said heat exchanger.

4,311,672
METHOD AND APPARATUS FOR PRODUCING CARBON BLACK

Robert H. Kallenberger, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 19,947, Mar. 12, 1979, Pat. No. 4,256,720.
This application Nov. 5, 1980, Ser. No. 204,117
Int. Cl.³ C01B *31/02*; C09C *1/48*
U.S. Cl. 422—150 **13 Claims**



1. Apparatus for producing carbon black comprising:

a carbon black reactor having a reaction chamber and a combustion chamber, said combustion chamber opening into the carbon black reaction chamber for introducing hot combustion gases into said carbon black reaction chamber;

means for supplying fuel to said carbon black reactor;

means for supplying an oxygen containing fluid to said carbon black reactor, the combustion of said fuel and said oxygen containing gas supplying said hot combustion gases;

means for supplying a carbonaceous feed to said carbon black reactor to therein convert said carbonaceous feed to a production carbon black;

means for combining a rerun carbon black, which has a CTAB number which does not meet predetermined specifications, with said production carbon black to thereby form a combined carbon black product;

means for establishing a first signal representative of the flow rate (F_{PC}) of said production carbon black to said means for combining said rerun carbon black with said production carbon black;

means for establishing a second signal representative of the flow rate (F_{RC}) of said rerun carbon black to said means for combining said rerun carbon black with said production carbon black;

means for establishing a third signal representative of the CTAB number ($CTAB_P$) of said production carbon black;

means for establishing a fourth signal representative of the CTAB number ($CTAB_R$) of said rerun carbon black;

means for establishing a fifth signal representative of the CTAB number ($CTAB_{PROD}$) of said combined carbon black product in response to said first, second, third and fourth signals;

means for establishing a sixth signal representative of the desired CTAB number for said combined carbon black product;

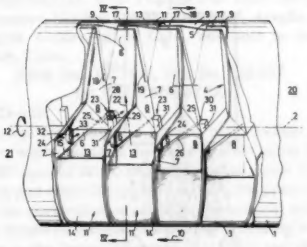
means for establishing a seventh signal responsive to the difference between said fifth signal and said sixth signal; and

means for controlling the flow rate of said carbonaceous feed to said carbon black reaction chamber in response to said seventh signal to thereby maintain a desired CTAB number for said combined carbon black product.

4,311,673
APPARATUS FOR EXTRACTING WITH A LIQUID, PRODUCTS WHICH ARE PART OF SOLIDS

Georges F. M. Duchateau, Brussels; Charles H. J. Pinet, Hoegaarden, and Pierre X. Hanot, Jodoigne, all of Belgium, assignors to Raffinerie Tirlemontoise, Brussels, Belgium

Filed Sep. 17, 1980, Ser. No. 187,893
Claims priority, application Belgium, Oct. 4, 1979, 19747
Int. Cl.³ B01D *11/02*
U.S. Cl. 422—272 **7 Claims**



1. Apparatus for extracting by means of a liquid, products which are part of solids, comprising; a rotating drum having a substantially horizontal axis, two conveying spiral screws nested within one another and arranged co-axially with said axis, a partition passing through said drum axis and forming, together with the radial walls from the conveying screws, two series of succeeding cells inside which move continuously without mixing along a direction in parallel with said axis, two fractions of solids, one said fraction being contained inside that cell series lying on one side of said partition, the other fraction being contained inside those cells lying on the other partition side, a basket pervious to said liquid and arranged inside each one of said cells for separating the solids from the liquid during rotation of said drum, said basket comprising at least one perforated wall extending substantially parallel with said partition in

front thereof when considering the drum rotating direction, said wall being so arranged that said basket lies on one side of a plane perpendicular to said partition which passes through the drum axis, liquid channels arranged at the back of that basket substantially in parallel relationship with said partition and extending from the drum circumference, along the drum axis for feeding said liquid in a direction opposite a conveyance direction of said solids, each said channel connecting, through said partition and openings provided in the conveying screw walls, one cell from a screw conveying part of said one solid fraction to the following cell from the screw conveying the other solids fraction in such a way that the liquid flows in two discrete parallel flows which meet alternately succeedingly those solids lying inside each apparatus cell, and such that the liquid flows advance during one drum revolution over 360°, over two cells in the direction opposite to the conveying direction of said solids, while the solids advance but over but over one cell, with the improvement that said apparatus comprises in association with each of said liquid channels extending along the drum axis, a liquid channel arranged inside each cell and extending cross-wise to said axis, adjacent thereto, for collecting the liquid which has been separated from the solids and flowing over said wall, when same lies in a position near the horizontal and has moved past said position, said channel extending along the drum axis and the cross-wise channel associated therewith starting from one and the same cell and ending in one and the same cell.

4,311,674

METHOD OF SEPARATING ISOTOPES FROM GASEOUS MIXTURES

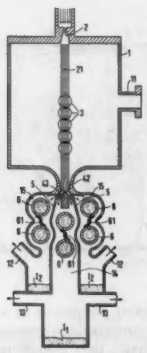
Karl Janner, Erlangen; Klaus Gregorius, Neunkirchen a. Brand; Hans-Joachim Niemann, Erlangen; Arno Kersting, Erlangen, and Eberhard Schuster, Erlangen, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim, Fed. Rep. of Germany

Continuation of Ser. No. 862,504, Dec. 20, 1977, abandoned. This application Jul. 9, 1979, Ser. No. 55,917

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659590

Int. Cl.³ B01D *59/00, 59/02*

U.S. Cl. 423—3 **17 Claims**



1. In a method of separating isotopes from a gaseous mixture of substances containing the isotopes by selective excitation of one isotope component in the gaseous mixture; the improvement comprising incorporating supplemental gas in admixture with the isotope components in said gaseous mixture of substances, adiabatically expanding the gaseous mixture containing the supplemental gas at an expansion ratio and starting temperature to cool the mixture and effect condensation of at least a portion of the supplemental gas with selective adsorption in the supplemental gas condensate of an isotope component which is non-excited by selective laser radiation and selective excitation by laser radiation of said one isotope component not adsorbed in said supplemental gas condensate and selective retention of the non-excited isotope component in the condensate, effecting said condensation during or after irradiation, and thereafter effecting physical separation due to differences in mass of said condensate with selective retention of the non-excited isotope component from the non-condensed gaseous mixture.

4,311,675

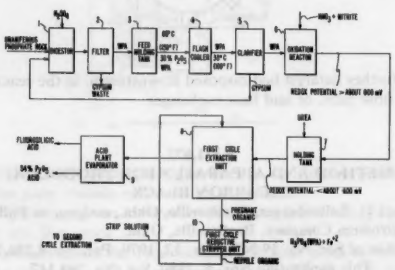
MAINTAINING REDUCTIVE STRIP EFFICIENCY IN URANIUM RECOVERY PROCESSES

Regis R. Stana, Lakeland, Fla.; Edward Mitchell, Pittsburgh; Joseph S. Rudolph, North Huntingdon, both of Pa., and Jose G. Lopez, Lakeland, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 23, 1980, Ser. No. 114,466

Int. Cl.³ B01D *11/04*

U.S. Cl. 423—8 **4 Claims**



2. In a method of recovering uranium from wet process phosphoric acid wherein: (1) the phosphoric acid is oxidized with nitric acid to provide uranyl ions in the acid and thereby contaminating the acid with nitrate and/or nitrite ions; (2) the oxidized phosphoric acid is contacted with an organic extractant to extract the uranyl ions into the organic; and (3) the organic is contacted with an aqueous stripping solution containing ferrous ion to strip the uranium from the organic into the stripping solution, the improvement comprising adding urea to the phosphoric acid after the oxidation to react with nitrate and/or nitrite ions therein.

4,311,676

PROCESS FOR THE RECOVERY OF URANIUM CONTAINED IN PHOSPHATED COMPOUNDS

Jean-Michel Demarthe, Viroflay, and Serge Solar, Rambouillet, both of France, assignors to Minemet Recherche, Trappes, France

Filed Mar. 2, 1979, Ser. No. 17,164

Claims priority, application France, Sep. 8, 1978, 78 25815; Feb. 23, 1979, 79 4761

Int. Cl.³ B01D *11/04*

U.S. Cl. 423—10 **20 Claims**

1. A process for recovering uranium from a uranium-containing acid lixiviation solution comprising: extracting the lixiviation solution with an organic extractant solution comprising a dialkyl pyrophosphoric acid, a diluent, and at least 0.5 mole of a solubilization agent for the double dialkyl pyrophosphate of uranium and ammonium which is present at any point during the process per mole of dialkyl pyrophosphoric acid, and treating the resulting mixture of solutions as follows:

(a) bubbling anhydrous ammonia gas into the loaded organic solution to precipitate the ammonium salt of the excess dialkyl pyrophosphoric acid, and

(b) separating the precipitate of step (a) from the uranium-

containing liquid phase and recovering uranium from the liquid phase.

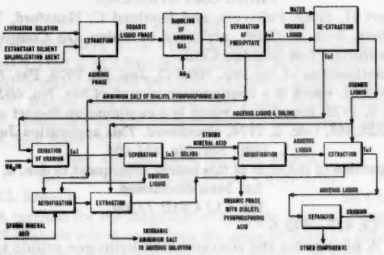
10. A process of recovering uranium from an aqueous uranium-containing acid lixiviation solution comprising: extracting the solution with an organic extractant solution comprising a diluent, a dialkyl pyrophosphoric acid, and at least one mole of a solubilization agent for both of the dialkyl pyrophosphorate of uranium and ammonium which is present at any point during the process per mole of dialkyl pyrophosphoric acid, and treating the resulting mixture of solutions as follows:

(a) bubbling into the mixture of solutions anhydrous ammonia gas to precipitate the ammonium salt of the excess dialkyl pyrophosphoric acid;

(b) separating the precipitate of step (a) from the uranium-containing liquid phase;

(c) contacting the liquid phase of step (b) with water, the volume of which is from about 0.5 to about 10% of that of the liquid phase from step (b) for from about 15 minutes to about 1 hour, and separating the organic phase from the aqueous and solid phases;

(d) treating the aqueous and solid phase from step (c) with ammonia until the pH of the solid-liquid phases is from about 8 to about 10;



(e) separating the aqueous liquid and solid phases obtained in step (d);

(f) combining the liquid phase from step (e) and the solid phase obtained in step (b) and acidifying with a strong mineral acid selected from the group consisting of sulfuric acid and phosphoric acid so that the pH of the resulting mixture is from about −1 to about 2;

(g) extracting the mixture of step (f) with a portion of the organic phase obtained in step (c) to form an organic phase charged with dialkyl pyrophosphoric acid and an ammonium salt solution of the acid used in step (f);

(h) redissolving the precipitate obtained in step (e) with a strong mineral acid selected from the group consisting of sulfuric acid and phosphoric acid;

(i) contacting the resulting mixture of (h) with an organic solution to reextract the dialkyl pyrophosphoric acid, the organic solution having a composition identical to that obtained in step (c) and the volume ratio of the mixture to the organic solution being from about 0.5 to about 4;

(j) treating the aqueous phase from step (i) to recover therefrom uranium, iron, the actinides and rare earth metals.

4,311,677
PROCESS FOR PRODUCING PHOSPHORIC ACID

Arthur B. Gerunda, West Islip, and Walter E. Goers, Briarcliff Manor, both of N.Y., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Dec. 3, 1979, Ser. No. 99,917
Int. Cl.³ C01B *25/237, 25/228;* C01G *43/00*
U.S. Cl. 423—18 **11 Claims**

1. A process for rendering uranium readily recoverable in a process for producing phosphoric acid and gypsum by (1) digesting phosphate rock containing small amounts of uranium with sulfuric acid and phosphoric acid to produce a high concentration of phosphoric acid and calcium sulfate hemihydrate, (2) filtering the resulting mixture to separate the concentrated phosphoric acid, (3) reslurrying the calcium sulfate hemihydrate and hydrating to produce calcium sulfate dihydrate in a low concentration phosphoric acid, (4) filtering the resulting mixture to obtain the calcium sulfate dihydrate as a by-product and the low concentration phosphoric acid as effluent, and (5) recycling the low concentration phosphoric acid effluent to an earlier process step, the improvement which comprises reducing the uranium in the digestion step (1) from the +6 valence state to the +4 valence state and thereby rendering said uranium insoluble in the wet process acid solution and causing same to precipitate with the calcium sulfate hemihydrate, and oxidizing said uranium during the reslurrying step (3) from the +4 valence state to the +6 valence state and thereby rendering said uranium soluble in the low concentration phosphoric acid and recoverable therefrom.

4,311,678
METHOD FOR REMOVING URANIUM-CONTAINING DEPOSITS IN URANIUM HEXAFLUORIDE PROCESSING EQUIPMENT

Eberhard Jacob, Feldafing, and Walter Bacher, Stutensee-Fr., both of Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft and Kernforschungszentrum Karlsruhe GmbH, both of Munich, Fed. Rep. of Germany

Filed Jan. 23, 1980, Ser. No. 114,506
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1979, 2902607; Jul. 30, 1979, 2930911
Int. Cl.³ C01G *43/06*
U.S. Cl. 423—19 **9 Claims**

1. A method of removing firmly adherent or powdery deposits in uranium hexafluoride handling equipment, wherein the deposits are eliminated at or above room temperature and at or below ambient pressure by the action of reaction products formed by the conversion of a fluorocarbon containing bromine with at least one fluorinating agent added in excess and applying the reaction products internally to said handling equipment.

4,311,679
TREATMENT OF SODIUM TUNGSTATE LEACH LIQUOR CONTAINING DISSOLVED SILICA, PHOSPHORUS, AND FLUORINE IMPURITIES

Paul B. Queneau, Golden; Leo W. Beckstead, Arvada, and Dale K. Huggins, Golden, all of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Jan. 19, 1981, Ser. No. 225,907
Int. Cl.³ C01G *41/00*
U.S. Cl. 423—55 **8 Claims**

1. A process for treating a filtered basic sodium tungstate leach liquor which contains dissolved therein about 20 ppm to about 10,000 ppm of silica, about 10 ppm to about 120 ppm of phosphorus, and about 500 ppm to about 4,000 ppm of fluorine, to reduce the concentration of silica, phosphorus and fluorine impurities dissolved therein, comprising providing a source of magnesium in the liquor for removal of silica and phosphorus from solution in the liquor, while maintaining the liquor temperature between about 60° C. and about 100° C. and the liquor pH between about 9 and about 11, filtering the liquor, adjusting the liquor pH to between about 6 and about 8 and the liquor temperature to between about 20° C. and about 60° C., and then providing aluminum hydroxide in the filtered liquor for removal of fluorine from solution in the liquor while maintaining the liquor temperature between about 20° C. and about 60° C. and the liquor pH between about 6 and about 8, whereby the magnesium and the aluminum hydroxide lower the silica concentration to below about 10 ppm, the phosphorus concentration to below about 5 ppm, and the fluorine concentration to below about 200 ppm.

7. A process for treating a filtered basic sodium tungstate leach liquor to reduce the concentration of silica, phosphorus and fluorine impurities dissolved therein, comprising providing

a source of magnesium in the liquor in an amount corresponding to about 0.1 gpl to about 3.0 gpl of magnesium ion, while maintaining the liquor temperature between about 60° C. and about 100° C. and the liquor pH between about 9 and about 11, filtering the liquor, adjusting the liquor pH to between about 6 and about 8 and the liquor temperature to between about 20° C. and about 60° C., and then providing an amount of aluminum hydroxide in the filtered liquor corresponding to about 0.1 gpl to about 3.0 gpl of aluminum ion while maintaining the liquor temperature between 20° C. and about 60° C. and the liquor pH between about 6 and about 8.

4,311,680

METHOD FOR REMOVAL OF SULFUR COMPOUNDS FROM A GAS STREAM

Kenneth J. Frech, Tallmadge, and James J. Tazuma, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 20, 1980, Ser. No. 208,613
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—230 **11 Claims**

1. A process for removing hydrogen sulfide, sulfides and mercaptans from a gas stream which comprises the steps in combination of:

(a) contacting the gas stream with an oxide of a metal selected from the group consisting of iron, chromium, cobalt, lead, manganese, molybdenum, nickel, copper, vanadium, zinc, tungsten and antimony;

(b) introducing an aqueous solution of hydrogen peroxide on the metal oxide while continuing to contact the gas stream with the metal oxide.

4,311,681

METHOD OF REGENERATING PHOSPHORIC ACID EXTRACTION SOLVENT

John S. C. Chiang, Mercerville, and William S. Moore, Princeton Junction, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed May 19, 1980, Ser. No. 150,866
Int. Cl.³ C01B *25/16*
U.S. Cl. 423—321 S **15 Claims**

1. In a process of washing a substantially water immiscible solvent with an aqueous solution to separate impurities from the solvent, the solvent being selected from the group consisting of alkyl phosphates, aryl phosphates and alkyl aryl phosphates, which solvent has been used to extract phosphoric acid from an impure phosphoric acid solution and from which the phosphoric acid has been stripped, the improvement which comprises conducting the washing with an aqueous alkali orthophosphate solution sufficient to maintain the pH of the solvent-aqueous mixture at from about 9.5 to about 12.5.

4,311,682

PROCESS FOR PREPARING A GRAPHITE PRODUCT

Takane Miyazaki, Tokyo, and Takeshi Ikeda, Yokohama, both of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Sep. 2, 1980, Ser. No. 183,274
Claims priority, application Japan, Sep. 6, 1979, 54-114651
Int. Cl.³ C01B *31/04*
U.S. Cl. 423—448 **7 Claims**

1. A process for preparing a graphite product, which comprises:

(a) mixing a hydrocarbon material derived from coal with a hydrocarbon solvent having a boiling point or a distillation temperature for 95 vol % of the solvent less than 350° C. and a B.M.C.I. value of 5 to 70, said value being defined as

$$B.M.C.I. = 48{,}640/k + 473.7S - 456.8$$

wherein k is the average boiling point (°K.) and S is the specific gravity at 60° F.;

(b) separating insoluble material which settles from the resulting mixture upon standing;

(c) removing by distillation at least a portion of said solvent from the insoluble matter free mixture;

(d) coking the residue obtained after distillation, thereby forming an acicular, green coke;

(e) calcining said acicular green coke, thereby obtaining an acicular calcined coke having a pore volume of more than 40×10^{-3} cc/g; and

(f) blending said acicular calcined coke with a binder, shaping the blend and graphitizing said blend at a high temperature.

4,311,683

PROCESS FOR REMOVAL OF HYDROGEN SULFIDE FROM GAS STREAMS

Robert H. Hass, Fullerton, and Rowland C. Hansford, Yorba Linda, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 700,513, Jun. 28, 1976, Pat. No. 4,243,647, which is a continuation-in-part of Ser. No. 602,416, Aug. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 528,845, Dec. 2, 1974, abandoned. This application Jun. 23, 1980, Ser. No. 161,694
The portion of the term of this patent subsequent to Jan. 6, 1998, has been disclaimed.
Int. Cl.³ C01B *17/04*
U.S. Cl. 423—573 G **43 Claims**

1. A process for the conversion of hydrogen sulfide to elemental sulfur, which process comprises contacting hydrogen sulfide and elemental oxygen with a solid catalyst comprising one or more vanadium promoters selected from the group consisting of vanadium oxides and sulfides on a non-alkaline, porous refractory oxide support under conditions, including a temperature between about 250° and 450° F., such that said hydrogen sulfide reacts with said oxygen to produce elemental sulfur.

4,311,684

PROCESS FOR PRODUCING IRON OXIDE CONTAINING MAGNETITE

Shinji Umeki, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1980, Ser. No. 143,511
Claims priority, application Japan, May 11, 1979, 54/58355
Int. Cl.³ C01G *49/08*
U.S. Cl. 423—632 **2 Claims**

1. In a process for producing an iron oxide comprising magnetite as the main component by heating a powder of goethite, lepidocrosite, α-iron oxide or γ-iron oxide in a reducing atmosphere, the improvement comprising using as the reducing atmosphere an inert gas containing steam and a gas of an organic compound for reducing an iron oxide selected from the group consisting of lower alcohols, ketones, ethers, esters and hydrocarbons; wherein the ratio of steam to the gas of an organic compound is in the range of 2–500% by volume; and wherein the heating is carried out at 500° to 700° C.; the iron oxide comprising magnetite being unsintered and chemically stable and exhibiting a higher H_c than the iron oxide comprising magnetite prepared as above but heated at a lower temperature.

4,311,685

ASSAY METHOD AND KIT

Solomon H. Snyder, Baltimore, Md., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 940,712, Sep. 8, 1978, Pat. No. 4,248,853. This application Jun. 18, 1979, Ser. No. 49,418

The portion of the term of this patent subsequent to Feb. 3, 1998, has been disclaimed.

Int. Cl.[3] G01N *33/60*; G01T *1/00*

U.S. Cl. 424—1 19 Claims

1. The method of determining the concentration of free β-adrenergic blocking drugs and any active metabolites thereof in a body fluid containing same comprising (a) dialyzing the body fluid (b) mixing together β-adrenergic receptor material, radioactive β-adrenergic receptor binder and the dialyzed body fluid, and measuring the amount of the radioactive β-adrenergic binder on the β-adrenergic receptor material and (c) mixing together a concentration of a standard amount of non-radioactive β-adrenergic receptor binder, β-adrenergic receptor material and radioactive β-adrenergic receptor binder and measuring the amount of radioactive β-adrenergic receptor binder on the β-adrenergic receptor material.

4,311,686

METHODOLOGY FOR THE IMMUNODIAGNOSIS OF MULTIPLE SCLEROSIS AND/OR MALIGNANT DISEASES FROM BLOOD SAMPLE ANALYSIS

John W. Angers, Red Bank, N.J., and Lazar Korik, Brooklyn, N.Y., assignors to The Immunology Development Corporation, Red Bank, N.J.

Filed Apr. 30, 1979, Ser. No. 87,024

Int. Cl.[3] G01N *33/54, 33/56*; C07G *7/00*

U.S. Cl. 424—1 50 Claims

1. A method for the diagnosis of multiple sclerosis by blood sample analysis which comprises the steps of mixing a putative antigenic blood extract prepared from multiple sclerosis-sensitized blood and specific to multiple sclerosis-sensitized blood leukocytes with leukocytes of the blood sample and promoting the reaction therebetween to inhibit the ability of the multiple sclerosis-sensitized leukocytes of the blood sample to adhere to a glass surface, and determining the extent to which said leukocyte adherence ability has been inhibited.

4,311,687

RADIOMETRIC ASSAY OF DIALYSATES

William Hertl, Corning, and Gerald Odstrchel, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 940,702, Sep. 8, 1978, abandoned. This application Nov. 2, 1979, Ser. No. 90,535

Int. Cl.[3] G01N *33/54, 33/60*; G01T *1/00*

U.S. Cl. 424—1 4 Claims

1. In a method for determining the concentration of a free or unbound hapten in a liquid sample, which method is based on equilibrium dialysis and which comprises the steps of:

A. adding a radiolabeled hapten to the liquid sample;

B. dialysing the mixture resulting from step A;

C. separating the free hapten in the dialysate from radiolabeled nonhapten entities by absorbing such entities on a solid-phase material which is added to the dialysate;

D. removing such solid-phase material from the dialysate; and

E. measuring the amount of radiolabeled hapten in the dialysate; the improvement which comprises replacing steps C, D, and E with the following new steps, C′, D′, and E′:

C′. adding to the dialysate an immobilized antibody in an amount sufficient to complex with all hapten which has dialyzed, in which the antibody is specific for the hapten;

D′. separating the resulting immobilized antibody-hapten complex from the dialysate; and

E′. measuring the amount of radiolabeled hapten present in the immobilized antibody-hapten complex.

4,311,688

COMPOSITION AND METHOD FOR CANCER DETECTION IN HUMANS

Scott W. Burchiel, Albuquerque, N. Mex.; David R. Crockford, Nashua, N.H., and Buck A. Rhodes, Albuquerque, N. Mex., assignors to Serono Laboratories Inc., Braintree, Mass. and University Patents Inc., Norwalk, Conn.

Filed Oct. 29, 1979, Ser. No. 89,153

Int. Cl.[3] A61K *49/00, 43/00*; B65D *71/00*; G01T *1/00*

U.S. Cl. 424—1 14 Claims

1. A composition of matter comprising a radiolabeled antibody, said radiolabeled antibody either:

(a) being directly reactive with an antigen from the group consisting of anti-human chorionic gonadotropin, anti-human chorionic gonadotropin beta and mixtures thereof; or

(b) being reactive with a second antibody which is directly reactive with said antigen, said reactivity with said second antibody either being direct or through a series of at least one third antibody, the last of said series being directly reactive with said second antibody, said radiolabel consisting of technetium-99m.

4,311,689

METHOD AND CONTAINER FOR PRODUCTION OF DIAGNOSTIC SCANNING

Clinton F. Ruddock, Amersham, England, assignor to The Radiochemical Centre Limited, England

Filed Mar. 1, 1979, Ser. No. 16,617

Claims priority, application United Kingdom, Mar. 2, 1978, 08370/78

Int. Cl.[3] A61K *43/00, 49/00*; B65D *71/00*

U.S. Cl. 424—1 9 Claims

1. A method of treating a solution of technetium-99 m as pertechnetate to bring the technetium into a form suitable for diagnostic scanning, which method consists essentially of:

(a) providing a vessel containing under sterile conditions tin or a tin-containing alloy as a reducing agent for the pertechnetate, and a complexant for the reduced technetium, the contents of the vessel being present in a dry state,

(b) aseptically introducing into the vessel an aliquot of a solution containing pertechnetate ions, thereby forming a liquid mixture having a predetermined pH in the range 3 to 12 and containing a complex of technetium with a complexant therefor,

(c) and aseptically withdrawing from the vessel at least part of said aliquot comprising a complex of technetium with the complexant therefor.

4,311,690

TEST SET AND METHOD FOR THE DETERMINATION OF FREE HORMONES

Robert J. Buehler, Holliston; Teresa H. Chan, Burlington, both of Mass., and Franklin Lim, Richmond, Va., assignors to Damon Corporation, Needham Heights, Mass.

Continuation-in-part of Ser. No. 917,365, Jun. 20, 1978, abandoned. This application Jun. 14, 1979, Ser. No. 48,628

Int. Cl.[3] G01N *33/56*; A61K *43/00*; B01J *13/02*

U.S. Cl. 424—1 12 Claims

1. A process for determining in a protein-containing sample the presence of an unbound species capable of reversibly binding to protein, said process comprising the steps of:

incubating the sample with an antibody complementary to said species and a distinguishable analogue of said species, the sample and antibody being separated by at least one membrane having a porosity sufficient to allow travese of said species and its distinguishable analogue, but insufficient to allow passage of said antibody or protein-bound species,

allowing unbound species in the sample to traverse said membrane and to compete with its distinguishable analogue for binding sites on said antibody;

separating said antibody from unbound species and unbound analogue; and

determine the amount of said distinguishable analogue which is bound to said antibody or which is antibody free, said amount being indicative of the amount of species unbound to protein in the sample.

4,311,691

TOBACCO SMOKING INHIBITOR

Anthony T. Fichera, 319 Palos Verdes Blvd., #310, Redondo Beach, Calif. 90277

Division of Ser. No. 82,987, Oct. 9, 1979, Pat. No. 4,276,890, which is a continuation-in-part of Ser. No. 29,107, Apr. 11, 1979, abandoned. This application Feb. 6, 1981, Ser. No. 232,377

Int. Cl.³ A61K *9/68*

U.S. Cl. 424—48 **10 Claims**

1. A composition for inhibiting tobacco smoking comprising a gamma pyrone and an inert physiologically acceptable carrier capable of providing sustained release of the gamma pyrone in the mouth over a time period of at least ten (10) minutes, in unit dosage form containing from 20 mg to 300 mg of gamma pyrone per unit dose.

4,311,692

TERTIARY AMINE PERSONAL CARE COMPOSITION

Phillip G. Abend, Los Angeles, Calif., assignor to Quad Chemical Corporation, Long Beach, Calif.

Division of Ser. No. 101,775, Dec. 10, 1979, Pat. No. 4,281,201. This application Aug. 25, 1980, Ser. No. 181,216

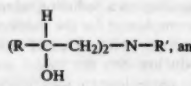
Int. Cl.³ A61K *7/06, 7/08, 7/09, 47/00*

U.S. Cl. 424—70 **9 Claims**

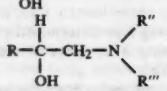
1. A water base skin and hair care composition including:

(a) 1–10 weight % of a fatty alcohol having from 14 to 20 carbon atoms;

(b) 1–5 weight % of a salt of a tertiary amine, the amine selected from the group consisting of:



(i)



(ii)

and mixture thereof, wherein

R is a linear C_8 to C_{20} alkyl group,

R′ is a hydroxyalkyl or polyhyroxyalkyl group having from 1 to 20 carbon atoms and one to five hydroxy groups per R′,

R″ and R ‴ are, individually, linear alkyl, hydroxyalkyl or polyhydroxyalkyl groups, each having from 1 to 6 carbon atoms and 1 to 5 hydroxyl groups per R″ or R‴ and wherein said salt is nontoxic to the skin or scalp;

(c) 0–2% of a thickener for composition; and

(d) the remainder being water.

4,311,693

DISCOVERY OF MSD A63A, A NEW EFROTOMYCIN-LINE ANTIBIOTIC FERMENTATION BROTH

Sebastian Hernandez, Madrid, Spain; Sheldon B. Zimmerman, Springfield, N.J.; Vincent P. Gullo, Edison, N.J., and Ray S. Dewey, Martinsville, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 17, 1980, Ser. No. 207,575

Int. Cl.³ A61K *35/00*

U.S. Cl. 424—122 **4 Claims**

1. The antibiotic MSD A63A which is a slightly deliquescent amorphous yellow powder having an estimated empirical formula of $C_{44}H_{64}N_2O_{10}$ whose trimethylsilyl derivative shows characteristic peaks in its mass spectrum at m/e 1122, 1032, 960, 706, 677, 604, 544, 517, 444 and 221; which shows an ultraviolet spectrum in methanol with maxima at 328 nm (E% 332), 286 (E% 289) and 224 (E% 757) with shoulders at 366 (E% 256) and 315 (E% 313) and which develops a characteristic spectrum after 30 minutes in 0.01 N hydrochloric acid in methanol which shows maxima at 324 nm (E% 440), 309 (E% 502), 295 (E% 420) and 223 (E% 838) with shoulders at 365 (E% 121) and 284 (E% 339); which shows a rotation of $\alpha_D^{26°} = -43°$ for a 1% solution in methanol; which has an infrared spectrum as shown in FIG. 1; and an ^1H NMR spectrum as shown in FIG. 2.

4,311,694

AMORPHOUS COPRECIPITATES OF 4-(MONOALKYLAMINO) BENZOIC ACID AND DERIVATIVES AND CERTAIN WATER-SOLUBLE MATERIALS

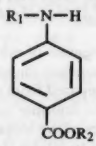
James E. Krueger, New City, and Eugene A. Carpentier, Spring Valley, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 31, 1979, Ser. No. 109,014

Int. Cl.³ A61K *31/70, 31/715*

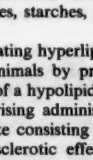
U.S. Cl. 424—180 **9 Claims**

1. An amorphous coprecipitate providing for substantially enhanced blood levels of a hypolipidemic and anti-atherosclerotic compound consisting essentially of a hypolipidemic and anti-atherosclerotic effective amount of a compound selected from those of the formula:



wherein R_1 is an unbranced or branched alkyl group C_nH_{2n+1} wherein n is 8 to 19 and R_2 is selected from the group consisting of hydrogen, lower alkyl, benzyl, dilower alkylaminoethyl and lower alkoxyethyl together with the pharmaceutically acceptable salts thereof and a coprecipitating amount of a pharmaceutically acceptable water-soluble polyhydroxylic organic compound selected from the group consisting of mono. and di-saccharides, starches, gums and polyglycols or combination thereof.

9. The method of treating hyperlipidemia and atherosclerosis in warm-blooded animals by providing for substantially enhanced blood levels of a hypolipidemic and anti-atherosclerotic compound comprising administering to said animal an amorphous coprecipitate consisting essentially of a hypolipidemic and anti-atherosclerotic effective amount of a compound selected from those of the formula:



wherein R_1 is an unbranched or branched alkyl group C_nH_{2n+1} wherein n is 8 to 19 and R_2 is selected from the group consisting of hydrogen, lower alkyl, benzyl, dilower alkylaminoethyl and lower alkoxyethyl together with the pharmaceutically acceptable salts thereof and a coprecipitating amount of a pharmaceutically acceptable water-soluble polyhydroxylic organic compound selected from the group consist-

ing of mono- and di-saccharides, starches, gums and polyglycols or combination thereof.

4,311,695
PERSONAL-CARE EMULSIONS COMPRISING A SILOXANE-OXYALKYLENE COPOLYMER

Michael S. Starch, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 3, 1979, Ser. No. 99,309
Int. Cl.³ A61K *31/695, 31/74*
U.S. Cl. 424—184 **4 Claims**

1. An emulsion composition consisting essentially of

(a) 25 to 80 parts by weight of a water-alcohol solution the weight ratio of water to alcohol in said solution being from 5/95 to 95/5,

(b) 8 to 73.5 parts by weight of a volatile liquid having a normal boiling point of less than 250° C., said volatile liquid being selected from the group consisting of methylsiloxane fluids having the average unit formula

$$(CH_3)_aSiO_{(4-a)/2}$$

wherein a has an average value of from 2 to 3 inclusive, paraffinic hydrocarbon fluids and their mixtures,

(c) 1 to 10 parts by weight of a personal-care component dissolved in said volatile liquid and selected from the group consisting of ester waxes, oils and fats of animal or vegetable origin, fatty alcohols, fatty acids, alkyl esters of fatty acids and hydrocarbon oils and waxes, and

(d) 0.5 to 2 parts by weight of a polydiorganosiloxanepolyoxyalkylene copolymer containing at least one polydiorganosiloxane segment and at least one polyoxyalkylene segment, said polydiorganosiloxane segment consisting of

$$R_bSiO_{(4-b)/2}$$

siloxane units wherein b has a value of from 0 to 3, inclusive, there being an average of approximately 2 R radicals per silicon atom in the copolymer, and R denotes a radical selected from the group consisting of methyl, ethyl, vinyl, phenyl and a divalent radical bonding a polyoxyalkylene segment to the polydiorganosiloxane segment, at least 95 percent of all R radicals being methyl; and said polyoxyalkylene segment having an average molecular weight of at least 1000 and consisting of from 0 to 50 mol percent polyoxypropylene units and from 50 to 100 mol percent polyoxyethylene units, at least one terminal portion of said polyoxyalkylene segment being bonded to said polydiorganosiloxane segment, any terminal portion of said polyoxyalkylene segment not bonded to said polydiorganosiloxane segment being satisfied by a terminating radical; the weight ratio of polydiorganosiloxane segments to polyoxyalkylene segments in said copolymer having a value of from 2/1 to 8/1, the total of (a) plus (b) plus (c) plus (d) being 100 parts by weight.

4,311,696
SUBSTITUTED BUTANOIC ACID ESTERS

John B. Adams, Jr., Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 12, 1981, Ser. No. 233,770
Int. Cl.³ C07C *117/04;* **A61K** *31/655*
U.S. Cl. 424—226 **4 Claims**

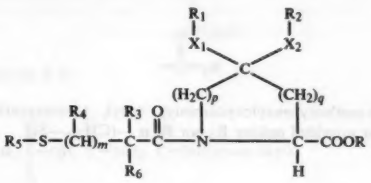
1. The compound 2-(4-azidophenyl)-3-methylbutanoic acid, α-cyano-3-phenoxybenzyl ester.

4,311,697
DERIVATIVES OF MERCAPTOACYL PROLINES AND PIPECOLIC ACIDS

John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 972,314, Dec. 22, 1978, abandoned. This application Nov. 30, 1979, Ser. No. 99,164
Int. Cl.³ A61K *31/40, 31/445;* **C07D** *207/16, 211/34*
U.S. Cl. 424—240 **30 Claims**

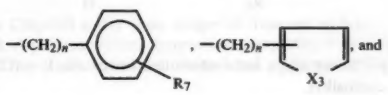
1. A compound of the formula

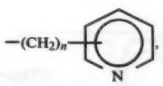


or a pharmaceutically acceptable salt thereof wherein

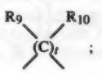
R is hydrogen or lower alkyl;

R_1 and R_2 are independently selected from the group consisting of lower alkyl, lower alkenyl, lower alkynyl, cycloalkyl, halo substituted lower alkyl, hydroxy substituted lower alkyl,





or R_1 and R_2 join together in a polymethylene chain of the formula



X_1, X_2 and X_3 are independently selected from the group consisting of oxygen and sulfur;

R_3 and R_4 are independently selected from the group consisting of hydrogen, lower alkyl, lower alkylthio, $-(CH_2)_n-SH$, and halo substituted lower alkyl;

R_6 is hydrogen or lower alkyl provided that R_6 is lower alkyl only when R_3 is lower alkyl;

m is zero, one or two;

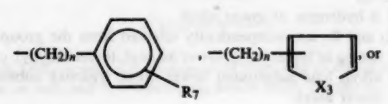
n is one, two or three;

p and q are each one or two provided that both are not two;

t is two or three;

R_7 is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, or hydroxy;

R_9 and R_{10} are both hydrogen, both lower alkyl, or one is hydrogen and the other is lower alkyl, halo substituted lower alkyl, hydroxy substituted lower alkyl,



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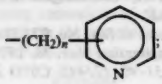
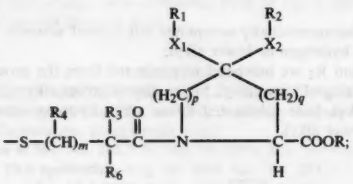


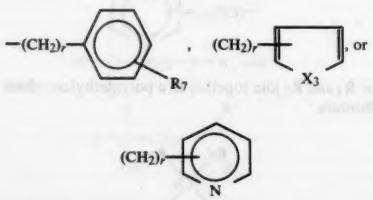
R_5 is hydrogen,

p-methoxybenzyloxycarbonyl, trityl, t-butoxycarbonyl, or provided neither R_3 nor R_4 is $-(CH_2)_n-SH$



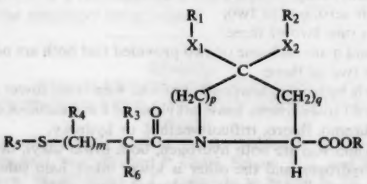
and

R_8 is lower alkyl, halo substituted lower alkyl, $-(CH_2)_r$ cycloalkyl,



wherein r is zero, one, two or three and R_7 and X_3 are as defined above.

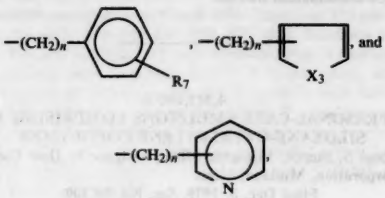
27. A composition for treating hypertension containing a pharmaceutically acceptable carrier and from 10 to 500 mg. of a compound or mixture of compounds or pharmaceutically acceptable salts thereof of the formula



wherein

R is hydrogen or lower alkyl;

R_1 and R_2 are independently selected from the group consisting of lower alkyl, lower alkenyl, lower alkynyl, cycloalkyl, halo substituted lower alkyl, hydroxy substituted lower alkyl,



or R_1 and R_2 join together in a polymethylene chain of the formula

X_1, X_2 and X_3 are independently selected from the group consisting of oxygen and sulfur;

R_3 and R_4 are independently selected from the group consisting of hydrogen, lower alkyl, lower alkylthio, $-(CH_2)_n-SH$, and halo substituted lower alkyl;

R_6 is hydrogen or lower alkyl provided that R_6 is lower alkyl only when R_3 is lower alkyl;

m is zero, one, or two;

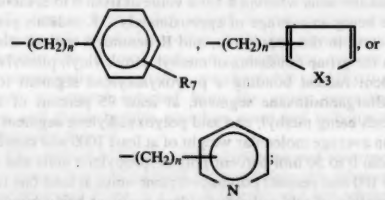
n is one, two, or three;

p and q are each one or two provided that both are not two;

t is two or three;

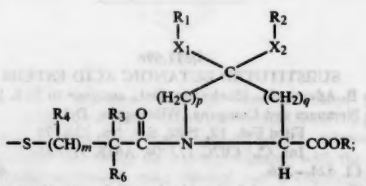
R_7 is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl or hydroxy;

R_9 and R_{10} are both hydrogen, both lower alkyl, or one is hydrogen and the other is lower alkyl, halo substituted lower alkyl, hydroxy substituted lower alkyl,



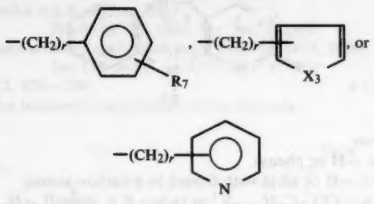
R_5 is hydrogen,

or provided that neither R_3 nor R_4 is $-(CH_2)_n-SH$



and

R_8 is lower alkyl, halo substituted lower alkyl, $-(CH_2)_r$-cycloalkyl,



wherein r is zero, one, two, or three and R_7 and X_3 are as defined above.

4,311,698

AMINOACID DERIVATIVES OF CEPHALOSPORIN COMPOUNDS

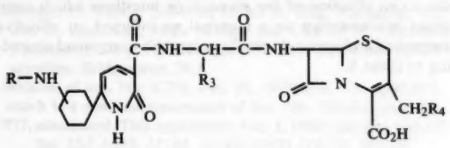
Theodore H. Haskell, 3860 Loch Alpine Dr. W.; Thomas F. Mich, 915 Sunset Rd., both of Ann Arbor, Mich. 48103; Dietrich Schweiss, 7136 Plymouth Rd., and Townley P. Culbertson, 2996 Argonne, both of Ann Arbor, Mich. 48105

Continuation-in-part of Ser. No. 19,983, Mar. 12, 1979, abandoned. This application Jan. 31, 1980, Ser. No. 112,655

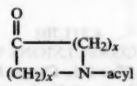
Int. Cl.[3] **A61K** *31/545;* **C07D** *501/34, 501/56*

U.S. Cl. 424—246 **52 Claims**

1. A compound of the formula

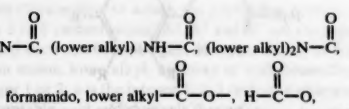


and pharmaceutically acceptable salts thereof; wherein R is

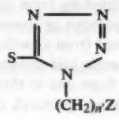


or R_1-[R_5N-acyl]$_n$; x is an integer of from one to five; x' is zero, one or two, R_1 is hydrogen, lower alkyl, benzyl or

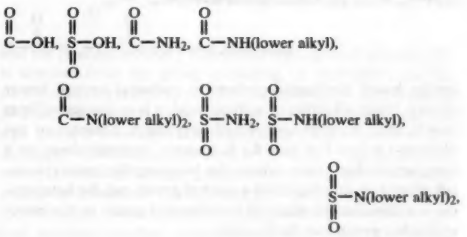
wherein R_2 is hydrogen, amino, or lower alkyl group of from one to four carbon atoms, optionally substituted by from one to three chlorine or fluorine atoms, R_5 is hydrogen or lower alkyl and N-acyl is an aminoacyl moiety derived from a carboxylic acid of from two to ten carbon atoms, optionally substituted by from one to three of the following groups, hydroxyl, carboxyl,



amino, lower alkylamido, carbamido, carbonyl oxygen, lower alkoxy, lower alkylthio, or sulfonic acid, n is an integer of from one to four; R_3 is phenyl, 4-hydroxyphenyl, 2-thienyl or cyclohexa-1,4-dien-1-yl and R_4 is acetoxy, carbamoyloxy, or a heterocyclicthio group where the heterocyclic moiety is unsubstituted or substituted by a methyl group and the heterocycle is a thiadiazolyl, triazolyl or tetrazolyl group or the heterocyclicthio group has the formula



wherein Z is



or CH_2-OH and n' is an integer of from one to four.

51. A pharmaceutical composition comprising from 30 mg to 1000 mg of a compound of claim **1** and a pharmaceutical carrier.

4,311,699

AMINOACID DERIVATIVES OF CEPHALOSPORIN COMPOUNDS

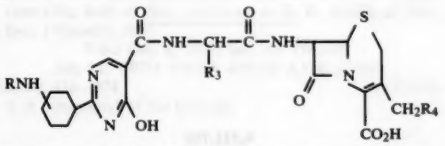
Theodore H. Haskell, 3860 Loch Alpine Dr. W.; Thomas F. Mich, 915 Sunset Rd., both of Ann Arbor, Mich. 48103; Joseph P. Sanchez, 739 Meadowlake Rd., Canton, Mich. 48188, and Dietrich Schweiss, 7136 Plymouth Rd., Ann Arbor, Mich. 48105

Continuation-in-part of Ser. No. 19,992, Mar. 12, 1979. This application Jan. 31, 1980, Ser. No. 112,656

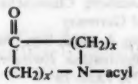
Int. Cl.[3] **A61K** *31/545;* **C07D** *501/34, 501/56*

U.S. Cl. 424—246 **51 Claims**

1. A compound of the formula

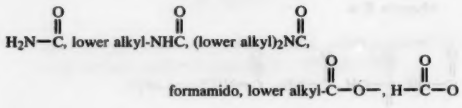


and pharmaceutically-acceptable salts thereof; wherein R is

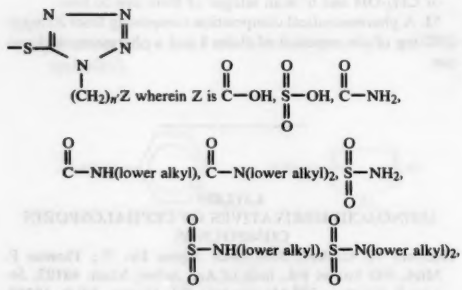


or R_1[NR_5-acyl]$_n$; x is an integer of from one to five; $_x$ is zero, one or two and ^{R_1} is hydrogen, lower alkyl, benzyl or

wherein R_2 is hydrogen, amino or a lower alkyl group of from one to four carbon atoms, wherein said carbon fragment is unsubstituted or substituted by from one to three chlorine or fluorine atoms; R_5 is hydrogen or lower alkyl and N-acyl is an aminoacyl moiety derived from a carboxylic acid of from two to ten carbon atoms wherein said aminoacyl moiety is unsubstituted or substituted by from one to three substituents selected from the group comprising hydroxyl, carboxyl,



amino, lower alkylamido carbamido, carbonyl oxygen, lower alkoxy, lower alkylthio or sulfonic acid; n is an integer of from one to four; R_3 is phenyl, 4-hydroxyphenyl, 2-thienyl or cyclohexa-1,4-dien-1-yl and R_4 is acetoxy, carbamoyloxy or a heterocyclicthio group where the heterocyclic moiety is unsubstituted or substituted by a methyl group and the heterocycle is a thiadiazolyl, triazolyl or tetrazolyl group or the heterocyclicthio group has the formula



or CH_2-OH and n' is an integer of from one to four.

50. A pharmaceutical composition comprising from 50 mg to 1000 mg of a compound of claim 1 and a pharmaceutical carrier.

4,311,700

PYRIMIDOBENZODIAZEPINONES, THEIR USE AND MEDICAMENTS CONTAINING THEM

Hartmann Schaefer, Constance, Fed. Rep. of Germany, assignor to BYK Gulden Lomberg Chemische Fabrik GmbH, Constance, Fed. Rep. of Germany

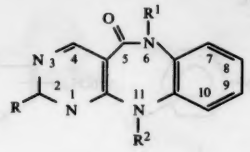
Filed Aug. 4, 1980, Ser. No. 175,243

Claims priority, application Switzerland, Aug. 10, 1979, 7334/79; Aug. 10, 1979, 7335/79

Int. Cl.³ C07D *487/04;* A61K *31/505, 31/55*

U.S. Cl. 424—248.54 **25 Claims**

1. A compound of the formula



wherein

R is —H or phenyl,

R^1 is —H or alkyl with from 1 to 4 carbon atoms,

R^2 is —CO—C_nH_{2n}—R^3 or (when R is phenyl) —H,

R^3 is halo or —$N(R^4)R^5$,

R^4 is alkyl with from 1 to 4 carbon atoms or alkenyl with from 3 to 5 carbon atoms,

R^5 is alkyl with from 1 to 4 carbon atoms and optionally substituted by dialkylamino with from 1 to 4 carbon atoms in each alkyl, or alkenyl with from 3 to 5 carbon atoms or

R^4 and R^5, together with the nitrogen atom to which both are bound, are pyrrolidino, piperidino, morpholino, perhydroazepino, piperazino which is optionally substituted in the 4-position by a methyl, ethyl or benzyl group, or homopiperazino which is optionally substituted in the 4-position by methyl, and

n is 1 or 2,

or an N-oxide or an acid-addition salt (with an inorganic or organic acid) thereof.

25. A method for the treatment and prophylaxis of disease due to an affection of the stomach or intestines which comprises administering to a mammal so inflicted an effective amount of a pharmacologically-acceptable compound according to claim 1.

4,311,701

TREATMENT OF CONVULSIONS WITH TRIAZINES

Barbara Roth, 7 Lone Pine Rd., Chapel Hill, N.C. 27514; Alistair A. Miller, 91 Elmshurst Gardens, Tonbridge, Kent, and David A. Sawyer, 60 Bourne Vale, Hayes, Kent, both of England

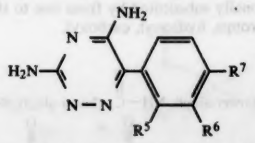
Filed Aug. 14, 1980, Ser. No. 177,886

Claims priority, application United Kingdom, Aug. 16, 1979, 28641/79

Int. Cl.³ A61K *31/53*

U.S. Cl. 424—249 **8 Claims**

1. A method of treatment of convulsions in a human comprising the oral administration to a human of a non-toxic anticonvulsant effective amount of a compound of the formula (III):



(III)

or a pharmaceutically acceptable acid addition salt thereof, wherein R^6 is a hydrogen atom, R^5 is a chlorine atom and R^7 is a hydrogen or chlorine atom or R^7 is a chlorine atom, R^5 is a hydrogen atom and R^6 is a chlorine atom.

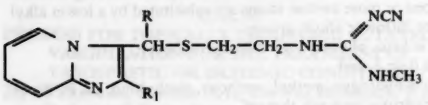
4,311,702

IMIDAZO[1,2-a]PYRIDINES HAVING ANTI-ULCER ACTIVITY

Giangiacomo Massaroli, Milan, Italy, assignor to Poli Industria Chimica S.p.A., Milan, Italy

Filed Oct. 30, 1980, Ser. No. 202,055
Claims priority, application Italy, Nov. 14, 1979, 27292 A/79
Int. Cl.[3] A61K *31/435;* C07D *471/04*
U.S. Cl. 424—256 6 Claims

1. An imidazo[1,2-a]pyridine of the formula



(I)

where R represents H or CH_3 and R_1 represents H or CH_3.

6. Pharmaceutical composition useful for the treatment of gastric hypersecretion including an effective amount of a compound of claim 1 associated with a non-toxic carrier or diluent.

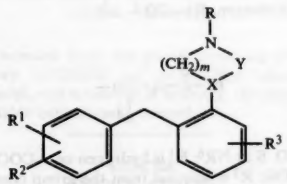
4,311,703

ANTIDEPRESSANT AND TRANQUILIZING (α-PHENYL-2-TOLYL)-AZACYCLOALKENES

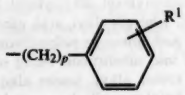
Lawrence L. Martin, Lebanon; Helen H. Ong, Whippany; Vernon B. Anderson, High Bridge, and Charles A. Crichlow, Piscataway, all of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Division of Ser. No. 6,791, Jan. 25, 1979, Pat. No. 4,241,071, which is a continuation-in-part of Ser. No. 763,294, Jan. 27, 1977, abandoned. This application Aug. 1, 1980, Ser. No. 174,450
Int. Cl.[3] A61K *31/44, 31/40;* C07D *211/70, 207/20*
U.S. Cl. 424—263 25 Claims

1. A compound of the formula



wherein X is CH or C; Y is CH=CH— when X is CH annd =CH—CH_2— when X is C; R is hydrogen, ioweralkyl, phenylloweralkyl of the formula



or, cycloalkylloweralkyl in which the cycloalkyl portion contains from 3 to 6 carbon atoms; R^1, R^2 and R^3 are the same or different and each can be hydrogen, halogen, alkoxy of from 1 to 2 carbon atoms, loweralkyl, hydroxy or trifluoromethyl; m is the integer 1 or 2; p is the integer 1, 2, 3 or 4; or a pharmaceutically acceptable acid addition salt thereof.

24. A method for treatment of depression which comprises administering to a depressed patient a pharmaceutically effective amount of an anti-depressant compound defined in claim 1.

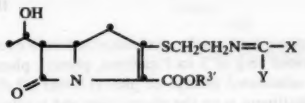
4,311,704

SUBSTITUTED N-METHYLENE DERIVATIVES OF THIENAMYCIN

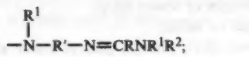
Burton G. Christensen, Metuchen; William J. Leanza, Berkeley Heights; David H. Shih, Edison, and Kenneth J. Wildonger, Somerville, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 803,177, Jun. 3, 1977, abandoned. This application Jun. 16, 1980, Ser. No. 159,573
Int. Cl.[3] C07D *487/04;* A61K *31/40, 31/44, 31/425*
U.S. Cl. 424—274 15 Claims

1. A compound having the structure:



and the pharmaceutically acceptable salts thereof wherein: $R^{3'}$ is selected from the group consisting of: hydrogen, methyl, t-butyl, pivaloyloxymethyl, 2,2,2-trichloroethyl, allyl, 3-methyl-2-butenyl, benzyl, benzylhydryl, p-t-butylbenzyl, phthalidyl, phenyl, 5-indanyl, acetoxymethyl, propionyloxymethyl, methallyl, 3-butenyl, 4-pentenyl, 2-butenyl, acetoxyacetylmethyl, methoxymethyl, p-acetoxybenzyl, p-pivaloylbenzyl, p-isopropoxybenzyl, 5-indanylmethyl, benzyloxymethyl, methylthioethyl, dimethylaminoacetoxymethyl, crotonolacton-3-yl, acetamidomethyl, pivaloylthiomethyl, methylthiomethyl; X is $—NR^1R^2$ when Y is —R′—N=$CRNR^1R^2$ and X is R when Y is



R^1 and R^2 at each occurance are independently selected from the group consisting of hydrogen, loweralkyl, loweralkenyl, cycloloweralkyl, loweralkylthioloweralkyl, benzyl and pyridyl; R is selected from the group consisting of hydrogen, loweralkyl, loweralkoxyloweralkyl, perfluoroloweralkyl, phenyl, pyridyl and thiazolyl; and R′ is $—(CH_2)_n—$ wherein n is an integer from 1 to 4.

15. An antibacterial pharmaceutical composition consisting of in unitary dosage form, a therapeutically effective amount of a compound according to claim 1 and a pharmaceutical carrier therefor.

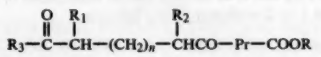
4,311,705

CARBOXYALKANOYL AND HYDROXYCARBAMOYLALKANOYL DERIVATIVES OF SUBSTITUTED PROLINES

Miguel A. Ondetti, Princeton, and Michael E. Condon, Lawrenceville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 6, 1980, Ser. No. 194,095
Int. Cl.[3] C07D *405/04, 409/02;* A61K *31/40*
U.S. Cl. 424—274 13 Claims

1. A compound of the formula



wherein

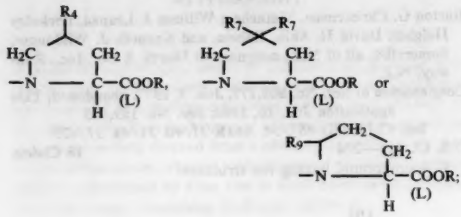
R is hydrogen or lower alkyl;

R_1 is hydrogen, lower alkyl or phenyl-lower alkyl;

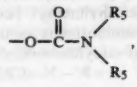
R_2 is hydrogen, lower alkyl, phenyl-lower alkyl or halo substituted lower alkyl;

R_3 is hydroxy, —NHOH or lower alkoxy;

Pr—COOR is a substituted proline of the structure



R_4 is halogen, keto, azido, cycloalkyl wherein cycloalkyl is a saturated ring of 3 to 7 carbons, phenyl, phenyl-lower alkyl, substituted phenyl or phenyl-lower alkyl wherein said substituent is on the phenyl ring and is selected from the group consisting of lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, Cl, Br, F and hydroxy of said phenyl ring is di or trisubstituted with a substituent selected from the group consisting of methyl, methoxy, Cl and F,

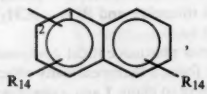


or Y-R_6;

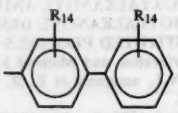
R_5 is hydrogen or lower alkyl;

Y is oxygen or sulfur;

R_6 is lower alkyl, phenyl, phenyl-lower alkyl, substituted phenyl or phenyl-lower alkyl wherein said substituent is on the phenyl ring and is as defined above, a substituted or unsubstituted 1- or 2-naphthyl of the formula

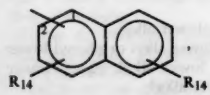


or a substituted or unsubstituted biphenyl of the formula

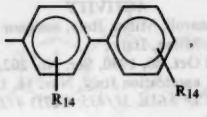


R_7 is halogen or —Y—R_8;

R_8 is lower alkyl, phenyl, phenyl-lower alkyl, substituted phenyl-lower alkyl wherein said substituent is on the phenyl ring and is as defined above, substituted or unsubstituted 1 or 2-naphthyl of the formula



or substituted or unsubstituted biphenyl of the formula



or the R_8 groups are lower alkyl which join to complete an unsubstituted 5- or 6-membered ring or such ring wherein one or more carbon atoms are substituted by a lower alkyl or di(lower alkyl) group;

R_9 is keto, phenyl, 2- or 4-hydroxyphenyl;

n is 0 or 1; and

R_{14} is hydrogen, methyl, methoxy, methylthio, Cl, F, Br, or hydroxy; or a salt thereof.

4,311,706

NOVEL DOPA/DOPAMINE PRODRUGS

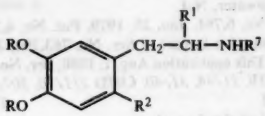
Nicholas S. Bodor, Gainesville, Fla.; Kenneth B. Sloan, Eudora, and Stefano A. Pogany, Lawrence, both of Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

Filed Jan. 22, 1980, Ser. No. 114,205

Int. Cl.[3] **C07C** *79/46, 101/72;* **A61K** *31/265;* **C07C** *101/44;* **A61K** *31/165;* **C07C** *102/00, 103/20, 97/16;* **C09F** *5/08;* **C07C** *153/00, 69/76, 69/00, 67/02, 101/20, 69/74, 67/02;* **A61K** *31/25, 31/235, 31/245, 31/22, 31/26, 31/255, 31/275, 31/215;* **C07C** *101/30, 101/02, 69/66, 69/34;* **A61K** *31/23, 31/225, 31/16;* **C07C** *101/00, 79/40, 101/26, 149/40*

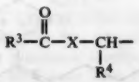
U.S. Cl. 424—301 **29 Claims**

1. A compound selected from the group consisting of those having (i) the structural formula (I):

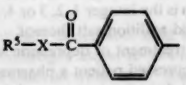


(I)

wherein each R is independently selected from the group consisting of hydrogen, R^3—CO— and



wherein X is O, S or NR^6; R^1 is hydrogen or —$COOR^8$; R^2 is hydrogen or OR; R^3 is selected from the group consisting of straight or branched chain alkyl having from 1 to 20 carbon atoms; aryl having from 6 to 10 carbon atoms; cycloalkyl having from 3 to 8 carbon atoms; alkenyl having from 2 to 20 carbon atoms; cycloalkenyl having from 4 to 8 carbon atoms; alkynyl having from 2 to 20 carbon atoms; aralkyl, alkaryl, aralkenyl, aralkynyl, alkenylaryl, alkynylaryl, loweracyloxyalkyl, and carboxyalkyl, wherein alkyl, aryl, alkenyl and alkynyl are as defined above; and mono- or polysubstituted derivatives of the above, each of said substituents being selected from the group consisting of lower alkyl, lower alkoxy, lower acyl, lower acyloxy, halo, haloloweralkyl, cyano, lower alkoxycarbonyl, loweralkylthio, amino, nitro loweralkylamino, diloweralkylamino, carboxyl, carbamyl, loweralkylcarbamyl, diloweralkylcarbamyl and



wherein R^5 is hydrogen or alkyl having from 1 to 10 carbons; R^4 is hydrogen, R^3, lower acyl, cyano, haloloweralkyl, carbamyl, loweralkylcarbamyl, diloweralkylcarbamyl, $—CH_2ONO_2$ and $—CH_2OCOR^3$; R^6 is hydrogen or lower alkyl; R^7 is hydrogen, lower alkyl, $COCF_3$, $COOC(CH_3)_3$, $COOCH_2C_6H_5$, or N-protective group; R^8 is hydrogen, benzyl, or carboxyl protective group; with the proviso that at least one R must be $R^3COXCH(R^4)$-; and (ii) the non-toxic, pharmaceutically acceptable salts thereof.

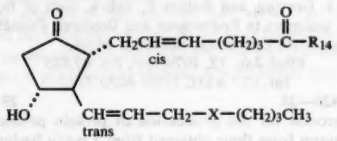
4,311,707

PROCESS FOR TOPICALLY PRODUCING CUTANEOUS VASODILATION FOR THE TREATMENT OF VASOSPASTIC OR ISCHEMIC CONDITIONS

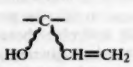
Jay E. Birnbaum, Pomona, N.Y.; Luc Van Humbeeck, Wauthier-Braine, and Franz Dessy, Braine Le Chateau, both of Belgium, assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 12, 1979, Ser. No. 11,364
Int. Cl.³ A61K *31/215*
U.S. Cl. 424—305 **9 Claims**

1. A method for producing an increase in local cutaneous and deep vessel circulation for individuals suffering from peripheral vascular disease of the arteriospastic and occlusive types which comprises topically administering to an individual suffering from said peripheral vascular disease an effective amount of a compound of the formula:



or a racemic mixture of that formula and the mirror image thereof wherein X is



and R_{14} is selected from the group consisting of hydroxyl, C_1–C_6 alkoxy, $—CH_2OH$ and $—CH_2OR_{15}$ wherein R_{15} is C_2–C_6 alkanoyl, and when R_{14} is hydroxy, the pharmacologically acceptable cationic salts thereof.

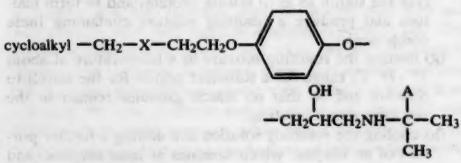
4,311,708

PHENOL ETHERS

Philippe M. J. Manoury, L'Hay les Roses; Icilio A. G. Cavero; Henry Najer, both of Paris, and Don P. R. L. Giudicelli, Fontenay sous Bois, all of France, assignors to Synthelabo, Paris, France

Division of Ser. No. 734,359, Oct. 20, 1976, Pat. No. 4,252,984. This application Mar. 14, 1979, Ser. No. 20,463
Claims priority, application France, Nov. 6, 1975, 75 33899
Int. Cl.³ A01N *33/02*; **C07C** *93/06*
U.S. Cl. 424—330 **18 Claims**

1. A compound of the formula



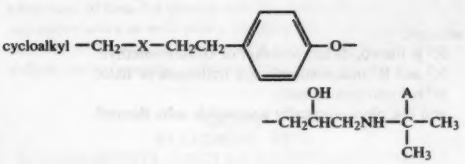
wherein

cycloalkyl is cyclopropyl, cyclobutyl, cycloamyl or cyclohexyl;

X is —O—, —S— or $—SO_2—$; and

A is hydrogen or methyl; or a pharmaceutically acceptable salt thereof.

12. A compound of the formula



wherein

cycloalkyl is cyclopropyl, cyclobutyl, cycloamyl or cyclohexyl;

X is —O—, —S— or $—SO_2—$; and

A is hydrogen or methyl

or a pharmaceutically acceptable salt thereof.

17. A method for the selective blocking of β_1-adrenergic receptors which comprises introducing into the environment of said receptors an effective amount of a compound of claim **1**, **8**, **9**, **10**, **11**, or **7**, whereby said β_1-adrenergic receptors are blocked.

18. A method for the selective blocking of β_1-adrenergic receptors which comprises introducing into the environment of said receptors an effective amount of a compound of claim **12**, **13**, **14**, or **15**, whereby said β_1-adrenergic receptors are blocked.

4,311,709

LOWERALKYL SUBSTITUTED DIPHENYL POLYAMINE AS AN ANTIMICROBIAL AGENT

Richard A. Dybas, Somerville; Nathaniel Grier, Englewood, and Bruce E. Witzel, Rahway, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 26, 1979, Ser. No. 106,980
The portion of the term of this patent subsequent to Oct. 23, 1996, has been disclaimed.
Int. Cl.³ A61K *31/135*
U.S. Cl. 424—330 **10 Claims**

1. A method for the prevention of mastitis in lactating dairy cows which comprises applying to either the udder, teats or both of such lactating dairy cows, a mastitis preventing effective amount of 1-amino-3-{{3-[4-(1-methylethyl)phenyl]-1-{2-[4-(1-methylethyl)phenyl]ethyl}propyl}amino]-2-propanol and pharmaceutically acceptable salts thereof.

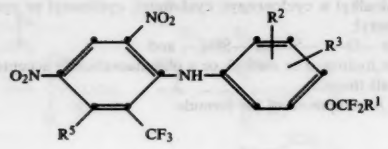
4,311,710

ANTICOCCIDIAL FORMULATION AND METHOD

Albert J. Clinton, deceased, late of Indianapolis, Ind. (by Cheryl L. Clinton, administrator), and American Fletcher National Bank and Trust Company, special administrator, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 8, 1980, Ser. No. 110,307
Int. Cl.³ A61K *31/135*
U.S. Cl. 424—330 **17 Claims**

1. A method for treating coccidiosis in animals comprising administering to an animal an anticoccidial amount of a benzenamine of the formula



wherein:

R^1 is fluoro, difluoromethyl or trifluoromethyl;

R^2 and R^3 independently are hydrogen or halo;

R^5 is hydrogen or halo;

and the physiologically acceptable salts thereof.

4,311,711

BIOCIDAL COMPOSITIONS

Arye Doron, Herzlia, Israel, assignor to Abic Ltd., Ramat-Gan, Israel

Continuation of Ser. No. 736,735, Oct. 29, 1976, abandoned. This application Apr. 18, 1980, Ser. No. 140,081

Claims priority, application Israel, Nov. 14, 1975, 48475

Int. Cl.³ A01N *31/08*

U.S. Cl. 424—346 **5 Claims**

1. A bactericidal composition comprising as essential coactive ingredients o-phenylphenol and 2,2'-methylene bis (4-chlorophenol) in a ratio of 1:1.

4,311,712

PROCESS FOR PREPARING FREEZE-DRIED LIPOSOME COMPOSITIONS

John R. Evans; Francis J. T. Fildes, and Jean E. Oliver, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 889,926, Mar. 24, 1978, abandoned. This application Aug. 20, 1979, Ser. No. 67,948

Claims priority, application United Kingdom, May 10, 1977, 19510/77

Int. Cl.³ A61K *47/00*

U.S. Cl. 424—365 **12 Claims**

1. A method for the manufacture of a freeze-dried, potential liposome, mixture which comprises dissolving at least one liposome-forming amphipathic lipid and at least one lipid-soluble or lipid-bound biologically active compound in an organic solvent which remains solid during the freeze-drying process, and then freeze-drying the solution to produce a freeze-dried, potential liposome, mixture.

8. A method for the manufacture of an aqueous liposome preparation containing at least one lipid-soluble or lipid-bound biologically active compound, which comprises dispersing a freeze-dried, potential liposome, mixture in a suitable aqueous medium, the said freeze-dried, potential liposome, mixture being obtained by dissolving at least one liposome-forming amphipathic lipid and at least one lipid-soluble or lipid-bound biologically active compound in an organic solvent which remains solid during the freeze-drying process, and then freeze-drying the resulting solution.

4,311,713

FEED INTAKE LIMITING ACIDULATED FAT FOR ANIMALS

Norman L. Betz, St. Louis, Mo.; Kent J. Lanter, Belleville, Ill., and Danny L. Williams, Manchester, Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 102,213, Dec. 10, 1979, abandoned, which is a continuation of Ser. No. 930,786, Aug. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 849,721, Nov. 9, 1977, abandoned. This application Nov. 7, 1980, Ser. No. 204,738

The portion of the term of this patent subsequent to Nov. 18, 1997, has been disclaimed.

Int. Cl.³ A23K *1/00*

U.S. Cl. 426—2 **27 Claims**

1. A feed supplement for animals containing an intake limiting composition, said feed supplement comprising grain, said intake limiting composition being present in an amount effective to limit intake of said supplement consisting essentially of an acidulated unsaponified fat selected from the group consisting of coconut oil, corn oil, cottonseed oil, palm oil, palm kernel oil, soybean oil, tallow, and grease which has been acidulated at a temperature of at least about 220° F. with an acid.

4,311,714

PRODUCTION OF PRODUCTS FROM WAXY BARLEY GRAIN

Kenneth J. Goering, and Robert F. Eslick, both of Bozeman, Mont., assignors to Endowment and Research Foundation at Montana State University, Bozeman, Mont.

Filed Jun. 12, 1979, Ser. No. 47,855

Int. Cl.³ A23L *1/09*; A23J *1/12*

U.S. Cl. 426—28 **29 Claims**

1. A process for the production of protein products and maltose syrup from flour obtained from a waxy barley grain, the steps of the process comprising:

(a) obtaining a waxy barley flour from waxy barley grain and mixing with sufficient water to form a paste;

(b) adding to the paste a beta-glucanase-containing enzyme in a sufficient amount to thin the paste and form a slurry and at least partially hydrolyze beta-glucans contained in the flour to place the beta-glucans in a form suitable for separation from the starch, and then subjecting the slurry to grinding;

(c) removing the ground slurry to a holding tank provided with agitation for a sufficient time period for the enzyme to at least partially hydrolyze beta-glucans contained in the mixture and release protein solids from solution, and thereby form a resulting suspension containing crude starch, protein solids and fiber;

(d) subjecting the suspension to a solids separation step based on particle size by which the protein solids and fiber products are substantially removed from the suspension to provide a starch suspension;

(e) adjusting the solids content of the starch suspension to about 40–60 wt. % starch solids by removal of excess liquid which comprises a fermentable mill water;

(f) adding sufficient water to form a 25–35 weight percent solids suspension of the starch, and adding to said suspension additional enzyme which contains at least amylase in a sufficient amount to at least partially hydrolyze beta-glucans contained in the starch and at least partially hydrolyze the starch so as to release proteins and to form maltose and produce a resulting mixture containing these components;

(g) heating the resulting mixture to a temperature at about 75°–76° C. range for a sufficient period for the starch to dissolve and so that no starch granules remain in the resulting starch solution;

(h) cooling the resulting solution and adding a further portion of an enzyme which contains at least amylase, and agitating for a sufficient time to effect additional starch

conversion, release protein and form maltose, and produce a resulting mixture of these components;

(i) heating the resulting mixture at a temperature of about 50° C. to 70° C. to substantially complete starch conversion, and form a mixture of protein solids in maltose syrup; and

(j) separating and recovering the protein solids and a liquid comprising a maltose syrup.

4,311,715

METHOD OF PREPARING ALBUMIN RICH FOODSTUFF RAW MATERIALS

Hideki Oka, Ueda; Keiji Itoga, and Tsutomu Mochizuki, both of Nagano, all of Japan, assignors to Nagano Miso Kabushiki Kaisha, Nagano, Japan

Filed Mar. 3, 1980, Ser. No. 126,943

Int. Cl.³ A23J *1/14;* A23L *1/20*

U.S. Cl. 426—46 **6 Claims**

1. A method of preparing albumin rich foodstuff raw material in the absence of salt comprising the steps of sterilizing malt by immersing the same in ethyl alcohol or an aqueous solution thereof having a concentration of at least 15% alcohol, boiling or steaming soya beans, mixing the sterilized malt with the steamed or boiled soya beans to form a mixture containing an added quantity of ethyl alcohol, said quantity of ethyl alcohol present in said mixture of malt and soya beans being at least about 3% and less than about 5% by weight based on the combined weight of the soya beans and the malt, and aging the resulting mixture for a time and at a temperature sufficient to produce said albumin rich foodstuff raw material.

4,311,716

FOOD PRODUCT MOULDING PROCESS

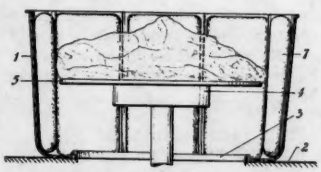
Noël Launay, Beauvais, France, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Mar. 3, 1981, Ser. No. 239,902

Claims priority, application France, Mar. 12, 1980, 80 05534

Int. Cl.³ A23G *9/04, 3/20, 3/28*

U.S. Cl. 426—275 **4 Claims**



1. A process for moulding a composite food product consisting of a plastic mass and firm elements arranged around and to the sides of said mass, comprising the steps of disposing a multiple-cavity mould having opposite open ends and open downwards on a fixed platform, placing a base in the mould above the bottom thereof on a vertically displaceable support, arranging said firm elements upright between said base and said cavities, said base being at a height relative to said firm elements sufficient to support and retain the firm elements in their upright position, filling the space delimited by said base and said elements with said plastic mass so that the plastic mass contacts the firm elements and lowering said base and said vertical displaceable support while filling is continued until said base comes to rest on the bottom of said mould thereby forming said composite food product.

4,311,717

STABILIZING AGENT FOR DRY MIX FOOD PRODUCTS

Emanuel J. McGinley, Morrisville, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed May 19, 1980, Ser. No. 150,821

Int. Cl.³ A23C *3/08;* A23L *2/00*

U.S. Cl. 426—330.2 **3 Claims**

1. A powder stabilizing agent for dry mix food products, the individual particles of said powder consisting of an intimate admixture of beta-1,4 glucan, sodium carboxymethyl cellulose and either whey or milk solids, the ratio by weight between the whey or milk solids and the beta-1,4 glucan combined with the sodium carboxymethyl cellulose being between 1:1 and 9:1.

4,311,718

FLAVORING WITH 2,4,4-TRIMETHYL-3-(BUTA-1,3-DIENYL)CYCLOHEX-2-EN-ONE

Roman Kaiser, Uster, and Dietmar Lamparsky, Wangen-Dubendor, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 889,070, Mar. 22, 1978. This application Aug. 22, 1979, Ser. No. 68,801

Claims priority, application Austria, Mar. 28, 1977, 2158/77

Int. Cl.³ A23L *1/226, 1/235*

U.S. Cl. 426—538 **3 Claims**

1. A method for enhancing the flavor of a product selected from the group consisting of fruit, foodstuffs, tea or soft drinks which comprises incorporating therewith practically pure 2,4,4-trimethyl-3-(buta-1,3-dienyl)-cyclohex-2-en-1-one in an amount equal to about 0.1 parts per million to 100 parts per million of the final product.

4,311,719

PROCESS FOR THE PRODUCTION OF COOKED MACARONI FOODS AND A PLANT WITH WHICH TO EFFECT THE SAID PROCESS

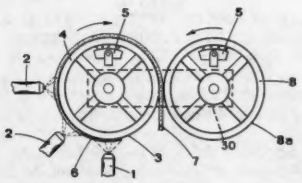
Sergio Falconi, via Alcide de Gasperi, San Nicolo a Tordino (Teramo), Italy

Filed Oct. 23, 1979, Ser. No. 87,687

Claims priority, application Italy, May 16, 1978, 49378 A/78

Int. Cl.³ A47J *37/00*

U.S. Cl. 426—557 **14 Claims**



1. A process for the production of cooked macaroni foods, wherein the normal basic ingredients are utilized in the preparation thereof, essential features of the process being that it comprises the following steps:

(a) preparing a liquid mixture containing the ingredients needed to make the macaroni product, using water or milk, or both, to dilute the mixture, and using at least one binding ingredient;

(b) constantly stirring the liquid mixture, and

(c) with the aid of one or more devices for nebulizing the liquid mixture, continuously or intermittently spraying the liquid mixture onto at least one surface heated to the macaroni cooking temperature, with the heated surface and the nebulization devices moving, one with respect to the other, in such a way as to produce a continuous prod-

uct that is cooked, contemporaneously with the production thereof, directly on the heated surface.

4,311,720

PROCESS FOR PRODUCING A FLAVORED HEATED BEVERAGE

Don Marmo, Farmingdale, and Frank L. Rocco, Richmond Hill, both of N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 57,270, Jul. 13, 1979, Pat. No. 4,253,473, which is a continuation-in-part of Ser. No. 17,580, Mar. 5, 1979, abandoned. This application Nov. 13, 1980, Ser. No. 206,615
The portion of the term of this patent subsequent to Nov. 18, 1992, has been disclaimed.
Int. Cl.³ A23F *3/40, 5/46*
U.S. Cl. 426—594 **6 Claims**

1. A process for producing a flavored consumable heated beverage wherein the flavor thereof is released at a high flavor intensity substantially evenly and uniformly over an extended period of time comprising the steps of:

(i) preparing a flavor powder by admixing:

(a) from about 3 up to about 7 parts by weight of a non-confined hydrophobic flavor oil;

(b) from about 3 up to about 7 parts by weight of a hydrolytically releaseable flavor oil physically entrapped in an edible solid material selected from the group consisting of gelatin, dextrin, gum acacia and modified food starch, said solid material having a particle size of from about 5 microns up to about 400 microns, said physically entrapped flavor oil being organoleptically compatible with said non-confined hydrophobic flavor oil;

(c) from about 0.1 up to about 1 part by weight of a solid suspending agent consisting of hydroxypropyl cellulose having a molecular weight of from about 50,000 up to about 800,000,

whereby a free flowing sustained release flavor powder is formed;

(ii) then intimately admixing the said flavor powder with an instant coffee or instant tea powder;

(iii) then adding the resulting powder to boiling water;

(iv) then allowing the resulting mixture to cool to a consumable temperature.

4,311,721

METHOD OF PURIFYING DISTILLERS SOLUBLES AND USE OF THE PURIFIED MATTER

Kiyoshi Yoshizawa, Tokyo; Kikuo Nojiro, Machida; Masamitsu Itoh, Hatoyama; Hiroshi Kiuchi, Sayama, and Kazuo Horii, Otani-Omiya, all of Japan, assignors to National Tax Administration Agency and Kibun Company Limited, both of Tokyo, Japan

Division of Ser. No. 902,225, May 2, 1978, Pat. No. 4,237,232, which is a division of Ser. No. 762,680, Jun. 26, 1977. This application Jun. 2, 1980, Ser. No. 155,834
Claims priority, application Japan, May 6, 1976, 51-50746; May 6, 1976, 51-50747; May 6, 1976, 51-50748; Jun. 17, 1976, 51-70428; Sep. 2, 1976, 51-104235
Int. Cl.³ A23K *1/00*
U.S. Cl. 426—623 **6 Claims**

1. In a feed composition comprising grain, soybean, fish protein, milk protein, meat protein or mixtures thereof, the improvement wherein

said feed composition further comprises a growth factor of molecular weight of 10^3–10^5 derived from distillers solubles by pretreatment with

(1) a centrifugal separation to a degree of above 50,000 (g×minute), or

(2) a filtration with addition of filter aid,

followed by collection of liquid parts of molecular weight of 10^3–10^5 by subjecting the obtained clarified liquid to a molecular sieve treatment.

4,311,722

HIGH FRUCTOSE HARD CANDY

Walter Vink, Purdys Station, and Richard W. Deptula, Port Chester, both of N.Y., assignors to Life Savers, Inc., New York, N.Y.

Filed Jul. 11, 1980, Ser. No. 167,500
Int. Cl.³ A23G *3/00*
U.S. Cl. 426—660 **9 Claims**

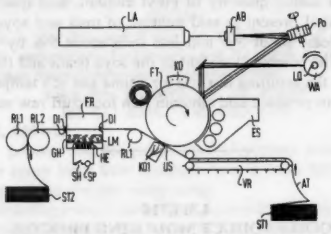
1. A substantially gas-free high fructose hard candy consisting essentially of from about 80 to about 98% fructose which candy is dry and shelf-stable, and further including from about 1 to about 20% by weight dextrin, inulin, a cellulose gum or mixtures thereof.

4,311,723

METHOD OF VAPOR FIXING A TONER

Hubert Mugrauer, Poering, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 63,905, Aug. 6, 1979. This application Dec. 8, 1980, Ser. No. 213,941
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1978, 2835284
Int. Cl.³ B05D *1/04*
U.S. Cl. 427—14.1 **2 Claims**



1. A method of vapor-fixing a toner on a data-carrier comprising contacting such toner with a solvent thereof composed of an azeotropic mixture consisting of about 50.5 wt. % of trichlortrifluorethane and about 49.5 wt. % of trichloromethane.

2. A method of vapor-fixing a toner on a data-carrier comprising contacting such toner with a solvent thereof composed of an azeotropic mixture consisting of about 87.5 wt. % of trichlortrifluorethane and about 12.5 wt. % of acetone.

4,311,724

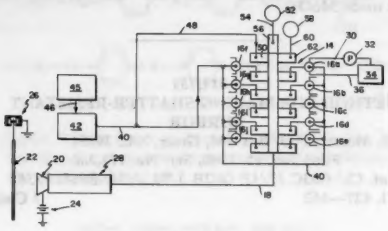
VARIABLE LOW-PRESSURE AIR COLOR CHANGE CYCLE

James A. Scharfenberger, Indianapolis, Ind., assignor to Ransburg Corporation, Indianapolis, Ind.

Filed Jan. 26, 1981, Ser. No. 228,166
Int. Cl.³ B05D *7/14, 1/00*
U.S. Cl. 427—8 **6 Claims**

1. In a process for terminating the flow of a coating material in a coating material delivery tube which delivers the coating material to a dispensing device from which the material is dispensed during a coating operation and from which flow of the material ceases at the end of the coating operation, the process including the steps of terminating the flow of coating material to the delivery tube before the end of the coating operation, and initiating the flow of gas at low superatmospheric pressure to the delivery tube to ensure continued delivery of coating material from the delivery tube to the dispensing device during the interval between shut-off of coating material flow to the delivery tube and the end of the coating operation,

the improvement comprising adjusting the low superatomospheric pressure to account for variations in coating material



characteristics to promote relatively constant delivery of coating materials having different characteristics.

4,311,725

CONTROL OF DEPOSITION OF THIN FILMS

Leslie Holland, Crowley, England, assignor to National Research Development Corporation, London, England

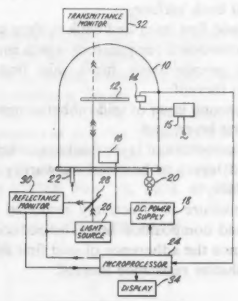
PCT No. PCT/GB79/00138, § 371 Date Apr. 18, 1980, § 102(e) Date Mar. 20, 1980, PCT Pub. No. WO80/00504, PCT Pub. Date Mar. 20, 1980

PCT Filed Aug. 10, 1979, Ser. No. 192,524

Claims priority, application United Kingdom, Aug. 18, 1978, 33927/78

Int. Cl.³ G05D *5/03;* **C23C** *13/08, 15/00;* **G01B** *7/06*

U.S. Cl. 427—10 **10 Claims**



1. Apparatus for sensing and controlling the deposition of a thin film on to a substrate from a gas or vapour phase comprising:

sensing means for (a) sensing the optical reflectance or optical transmittance or electrical resistivity of the deposited film and (b) providing a first signal having a parameter representative of the value of the sensed property;

an oscillatable crystal arranged adjacent to the substrate with at least one surface of the crystal exposed to the gas or vapour phase; and

timing and calculating means connected to the sensing means and to the oscillatable crystal and arranged to (a) determine the absolute resonance frequency of the oscillatable crystal, (b) provide a second signal representative of that frequency, to (c) determine the quotient of the change in the first signal and the change in the second signal over a first predetermined time interval, and (d) provide an output signal dependent on said quotient.

4,311,726

METHOD FOR THE MANUFACTURE OF A HIGH-TENSILE STRENGTH OPTICAL WAVEGUIDE

Heinz Hacker, Nuremberg; Hubert Aulich, Munich; Josef Grabmaier, Berg, and Nikolaos Douklias, Heimstetten, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

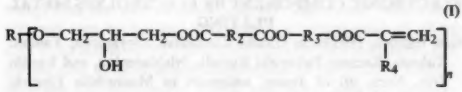
Filed May 30, 1980, Ser. No. 154,809

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1979, 2926415

Int. Cl.³ B05D *3/06, 5/06*

U.S. Cl. 427—54.1 **4 Claims**

1. In a method for the manufacture of a high-tensile strength optical waveguide with a plastic layer of the epoxideacrylate type located on the lightguide fiber through application of a radiation-hardenable prepolymer to the lightguide fiber immediately after the fiber-drawing process, the improvement comprising utilizing as said prepolymer an adduct, hardenable by actinic radiation, of at least one acylated hydroxy ester of acrylic and/or methacrylic acid and an epoxide with $n \leqq 3$ epoxide groups per molecule, said adduct corresponding to the general formula:



(I)

where

R_1 denotes the core of an epoxide with n epoxide groups;

R_2 is the core of an aliphatic, cycloaliphatic or aromatic dicarboxylic acid;

R_3 is an aliphatic or cycloaliphatic radical with 1 to 12 C-atoms;

R_4 is a hydrogen atom or a methyl group; and

n is an integral number between 1 and 3.

4,311,727

METHOD FOR MULTILAYER CIRCUITS AND METHODS FOR MAKING THE STRUCTURE

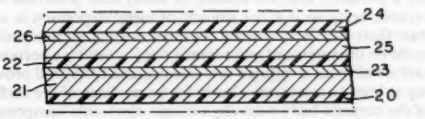
Jean-Pierre Lazzari, Montfort l'Amaury, France, assignor to Compagnie Internationale pour l'Informatique CII Honeywell Bull (Societe Anonyme), Paris, France

Division of Ser. No. 792,210, Apr. 29, 1977, Pat. No. 4,189,524. This application Feb. 15, 1979, Ser. No. 12,450

Claims priority, application France, May 6, 1976, 76 13553

Int. Cl.³ B05D *5/12;* **H01L** *21/283*

U.S. Cl. 427—58 **8 Claims**



1. The method of producing a multilayer thin film device adapted to withstand temperature elevations of up to 450° C. without appreciable risk of short-circuits between successive conductor layers thereof comprising the steps of repeatedly depositing in alternate deposition steps, one atop the other, thin film layers of a refractory insulating material and thicker film layers of a conductive material having relatively low resistivity and a relatively low appreciable thermal expansion as the temperature rises, further comprising the step of depositingly interposing between any such thicker conductive layer and at least an adjacent such thin film insulating layer a thin layer of a conductive material of higher resistivity than the said thicker layer conductive material, and virtually negligible thermal expansion at temperature elevations up to 450° C., and having crystallographic references intrinsically and/or epitaxially

similar to the corresponding lattice and mesh size references of the material of the said thicker layers.

4,311,728

METHOD FOR DEPOSITING PHOTOCONDUCTIVE ZINC TIN PHOSPHIDE

Joseph L. Sansregret, Scotch Plains, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 24, 1980, Ser. No. 200,454
Int. Cl.[3] H01L *31/18*
U.S. Cl. 427—74 15 Claims

1. A method for producing photoconductive films of zinc tin phosphide comprising:

coating a substrate with a layer of tin oxide;

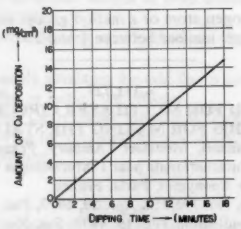
annealing said coated substrate in an ambient containing partial pressures of gaseous zinc or zinc chloride and phosphine at temperatures ranging from about 350° C. to about 500° C. whereby said tin oxide layer is converted to a layer of zinc tin phosphide.

4,311,729

METHOD FOR MANUFACTURING A CERAMIC ELECTRONIC COMPONENT BY ELECTROLESS METAL PLATING

Gen Itakura, Hirakata; Hideki Kuramitsu, Neyagawa; Yamato Takada, Katano; Takayuki Kuroda, Nishinomiya, and Yoshio Irie, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Inc., Osaka, Japan

Continuation of Ser. No. 874,763, Feb. 3, 1978, abandoned. This application Jan. 30, 1980, Ser. No. 116,963
Claims priority, application Japan, Feb. 9, 1977, 52-13800
Int. Cl.[3] H01C *17/18;* C23C *3/02*
U.S. Cl. 427—80 12 Claims



1. A method for manufacturing a ceramic electronic component comprising the steps of forming through electroless plating a precisely uniform coating of metal over a surface of a ceramic body so that the amount of metal deposition is constant thereover; heat-treating the metal coating to form a metal oxide on the surface of said ceramic body whereby a portion of said metal oxide is diffused into said ceramic body; and providing at least two separate electrodes on portions of the surface of the ceramic body whereby ceramic electronic components are produced having uniform electrical characteristics with a relatively small sample variance.

4,311,730

THICK FILM CIRCUITS

David J. Pedder, Oxford, England, assignor to Plessey Incorporated, New York, N.Y.

Filed Mar. 20, 1980, Ser. No. 131,910
Claims priority, application United Kingdom, Mar. 21, 1979, 09895/79
Int. Cl.[3] B05D *5/12*
U.S. Cl. 427—102 3 Claims

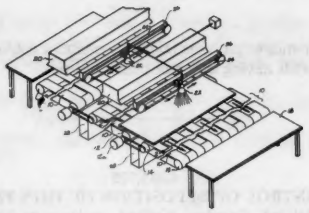
1. A method of producing a thick film resistor compatible with a copper conductor including providing a pattern of a mixture on a ceramic surface, said mixture comprising a metal powder and an oxide of the metal, and heating the patterned ceramic in an inert gas atmosphere such that the metal and the metallic oxide react to produce a conducting layer oxide, in which the metal is molybdenum and the metallic oxide is molybdic oxide MoO_3).

4,311,731

METHOD FOR MAKING SHATTER-RESISTANT MIRROR

John A. Messer, P.O. Box 648, Greer, S.C. 29651

Filed Jan. 11, 1980, Ser. No. 111,330
Int. Cl.[3] C03C *17/32;* G02B *5/08, 1/10;* B05D *1/38*
U.S. Cl. 427—162 7 Claims



1. A method of producing a shatter-resistant mirror article comprising:

supporting said mirror with a back surface facing up;

preheating said back surface of said mirror by heat treatment at a pre-determined temperature which heats and evaporates any moisture on the back surface without blistering the mirror;

spraying a first layer of a rubber composition over said preheated back surface;

subjecting said first layer and back surface to heat treatment at a predetermined temperature which removes any moisture and preparatorily heats said first layer without scorching thereof;

spraying a second layer of said rubber composition over said heated first layer, and

said heat treatments and layer thicknesses being applied as to cause said layers to be dried outwardly away from said back surface;

whereby moisture is effectively removed from said back surface and composition layers to reduce mirror defects and enhance the adherence of said first and second layers and the shatter resistance thereof.

4,311,732

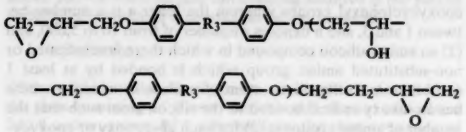
PRIMER COMPOSITION AND A PROCESS FOR PRODUCING A COATED PRODUCT USING THE SAME

Isao Kaetsu; Minoru Kumakura; Masaru Yoshida, all of Takasaki; Goro Shimaoka, Sakai, and Masanobu Urabe, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company Inc. and Japan Atomic Energy Research Institute, both of, Japan

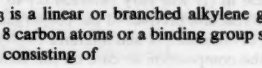
Filed Jun. 5, 1979, Ser. No. 45,854
Claims priority, application Japan, Jun. 6, 1978, 53-67916
Int. Cl.[3] B32B *27/00*
U.S. Cl. 427—164 5 Claims

1. A process of preparing a polycarbonate product coated with a film having desired characteristics which comprises

coating a polycarbonate substrate with a primer composition for providing the polycarbonate substrate with a top-coating, which primer is prepared by dissolving at least one diepoxy compound selected from the group consisting of diepoxides derived from a biphenol of the formula:



wherein R_3 is a linear or branched alkylene group having less than 8 carbon atoms or a binding group selected from the class consisting of



and n is an integer of from 1 to less than 10, in an amount of 0.1 to 50 parts by weight based on an amount of 100 parts by weight of at least one organic solvent selected from the group consisting of lower alcohols, ethers and ketones,

drying the primer-coated polycarbonate substrate to provide a dry primer coating,

coating the dry primer-coated substrate with a top-coating paint which is a thermosetting silane paint containing as an effective ingredient, one or more carbon functional silane compounds and

curing the paint with heat.

4,311,733

METHOD OF PREPARING A CAPILLARY HEAT-PIPE WICKING STRUCTURE

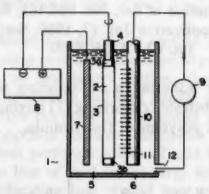
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Division of Ser. No. 876,551, Feb. 9, 1978, Pat. No. 4,200,674, which is a continuation of Ser. No. 556,203, Mar. 7, 1975, Pat. No. 4,120,994. This application Apr. 6, 1979, Ser. No. 27,848

Claims priority, application Japan, Mar. 11, 1974, 49-27077; Nov. 6, 1974, 49-127713; Nov. 29, 1974, 49-138062; Jan. 14, 1975, 50-6695

Int. Cl.³ F28F *13/18*

U.S. Cl. 427—230 **8 Claims**



5. A method of preparing a heat-exchanger member having a porous metallic heat-exchanger interface, comprising the steps of:

(a) disposing at least one surface of a substrate in contact with a chemical electroless plating solution containing a chemically or electrolessly depositable thermally conductive metal; and

(b) chemically electrolessly depositing said metal from said solution upon said surface so as to form a dendritic metallic layer thereon constituting said porous heat-exchanger interface.

4,311,734

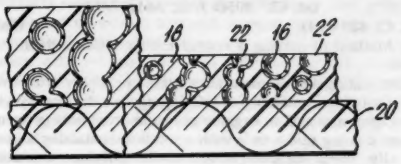
POROMERIC SHEET MATERIAL WITH DEPOROMERIZED AREAS

Ezekiel J. Jacob, 25 Monroe Pl., Brooklyn, N.Y. 11201

Filed Aug. 14, 1978, Ser. No. 933,543

Int. Cl.³ A43B *23/00*; B05D *3/02, 3/12, 5/00*

U.S. Cl. 427—245 **9 Claims**



1. The method of deporomerizing a selected area of a microporous poromeric material comprised of a plastic matrix which includes micropores to render said selected area substantially waterproof and to increase the mechanical strength thereof while retaining the porosity of the other areas of said material comprising the step of densifying the micropores within said selected area by heating said area to a temperature of about 250° F. to about 480° F. to render it pliable and subjecting said pliable area to mechanical compression of about 20 to 150 psi, whereby the micropores within said select area are substantially eliminated.

4,311,735

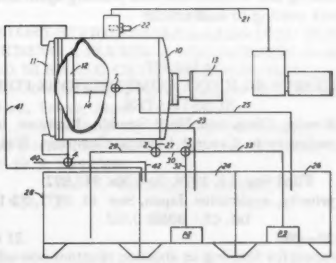
IMPREGNATION OF POROUS ARTICLES

Peter D. Young, St. Andrews, Guernsey, Channel Islands, assignor to Ultraseal International Limited, Vale, Guernsey, Channel Islands

Filed Jun. 24, 1980, Ser. No. 162,645

Int. Cl.³ C23C *13/08*; B05C *3/00*; B05D *1/18, 3/00*

U.S. Cl. 427—295 **11 Claims**



1. A method of impregnating a porous article with impregnant to seal the pores thereof, which comprises placing the article in a vessel, evacuating the vessel to withdraw air from the pores, releasing the vacuum with the pores beneath the surface of a liquid impregnant in the vessel, removing excess impregnant from the vessel, washing excess impregnant from the surface of the article in said vessel by supplying washing fluid to the vessel, removing the fluid from the vessel, heating the article while still within the vessel to effect curing of the impregnant within the pores, and removing the impregnated article from the vessel, wherein the article is rotated during at least a portion of the treatment of the article.

4,311,736

ARTICLE HAVING ORGANO-PHOSPHONITRILE RUBBER COATING BONDED TO NATURAL OR SYNTHETIC RUBBER AND METHOD OF MAKING

Koon-Wah Leong, Schaumberg, Ill., assignor to The Kendall Company, Boston, Mass.

Continuation-in-part of Ser. No. 21,336, Mar. 19, 1979, abandoned. This application Oct. 25, 1979, Ser. No. 88,157

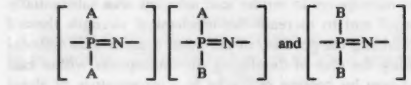
Int. Cl.³ B05D *3/02*; A61F *7/12*

U.S. Cl. 427—331 **8 Claims**

1. Method of making a coated rubber article which comprises

first coating a cured natural or synthetic rubber article with a solution containing as priming agent a di- or poly-vinyl compound and an organic peroxide cross-linking agent,

then coating said article with a solution containing a generally linear organo-phosphonitrile polymer containing randomly distributed repeating units having the structures:



wherein A represents RO—, RNH—, $X(CF_2)_mCH_2O$—, or $X(CF_2)_m$ CH_2NH— and B represents R'O—, R'NH, $Y(CF_2)_nCH_2O$—, or $Y(CF_2)_n$ CH_2NH—, R and R' each being selected from the group consisting of lower alkyl and aryl such as phenyl, tolyl, chlorophenyl, X and Y each being selected from the group consisting of hydrogen and fluorine, and m and n each being an integer from 1 to 8 inclusive, together with an organic peroxide curing agent in an amount from 0.1 to 5% by weight of said polymer, and an alkyl aluminum compound having the composition

$$Al\ R_1R_2R_3$$

wherein R_1 is selected from the group consisting of hydrogen and alkyl having from 2 to 8 carbon atoms and R_2 and R_3 are alkyl having from 2 to 8 carbon atoms, the amount of said aluminum compound being from 0.01 to 2% by weight of said polymer,

drying and heating said coated article at a temperature from room temperature to 70° C. to cure said organo-phosphonitrile polymer coating and to cross-link said priming agent and bond said polymer coating to said article.

4,311,737

ADHESIVE SILICONE COMPOSITIONS FOR SUBSTRATES

Mitsuo Ishizaka, Ohta, and Heiji Sumida, Menuma, both of Japan, assignors to General Electric Company, Waterford, N.Y.

Filed Sep. 13, 1978, Ser. No. 941,992

Claims priority, application Japan, Sep. 14, 1977, 52-110828

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—386 **21 Claims**

13. A process for forming an abrasion resistant non-adherent silicone coating with a good water resistance and good adherence to various substrates which is non-tacky comprising (i) applying to the substrate a silicone mixture selected from the class consisting of (A) a mixture of (1) a polyorganosiloxane of the general formula

$$\left(R_a^1\ SiO_{\frac{4-a}{2}}\right)_n$$

wherein Rdenotes a monovalent hydrocarbon radical selected from a hydrogen atom and a monovalent hydrocarbon radical which is substituted such that of all the R^1 radicals in a single molecule, at least 2 are monovalent hydrocarbon radicals that have been substituted by a group selected from glycydoxy or epoxycyclohexyl groups wherein the letter a is a number between 1 and 3, and n denotes a number of from 10 to 5,000, and (2) an amino silicon compound in which there is substituted or non-substituted amino group which is bonded by at least 1 carbon atom to the silicon atom of a silane or siloxane which has an alkoxy radical bonded to the silicon atom such that the number of amino groups in (2) for each glycydoxy or epoxycyclohexyl radical in (1) will vary between 0.1 to 10; and (B) a mixture of the reaction product of the polyorganosiloxane (1) and the silane or siloxane (2), and mixtures of (A) and (B); and (ii) allowing the composition to cure on the substrate.

4,311,738

METHOD FOR RENDERING NON-FERROUS METALS CORROSION RESISTANT

Frank K. Chi, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed May 27, 1980, Ser. No. 153,379

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—387 **11 Claims**

1. A method of rendering a non-ferrous metal substrate more resistant to corrosion which comprises the steps of

(I) coating a non-ferrous metal substrate with a pigment-free composition capable of forming an optically transparent cured coating which consists essentially of a dispersion of at least one colloidal metal oxide in a water/polar organic solvent solution of a partial condensate of a silanol having the average formula $CH_3Si(OH)_3$, said colloidal metal oxide being prepared by a solution precipitation method and being selected from the group consisting of colloidal titania and both colloidal titania and colloidal silica, said composition containing from 15 to 40 weight percent solids wherein said solids consist essentially of from 1 to 25 weight percent of said colloidal titania and from 0 up to, but not including, 20 weight percent of said colloidal silica, the remainder of said solids consisting essentially of said partial condensate calculated as $CH_3SiO_{3/2}$, said composition containing a sufficient amount of acid to provide a pH in the range of from 2 to 6, and

(II) curing said coating.

4,311,739

SELF-BONDING SILICONE RUBBER COMPOSITIONS

Bruce B. Hardman, Clifton Park, and George M. Dujack, Troy, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 963,637, Nov. 24, 1978, abandoned, which is a continuation of Ser. No. 884,461, Mar. 7, 1978, abandoned. This application Jul. 17, 1980, Ser. No. 169,685

Int. Cl.³ A23F *3/00*

U.S. Cl. 427—387 **9 Claims**

1. A process for adhering a self-bonding silicone rubber composition to a substrate comprising (1) mixing (A) 100 parts by weight of a base polymer of the formula,

where R is selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals, and x is such that the viscosity of the base polymer varies from 100 to 200,000,000 entipoise at 25° C.; (B) from 0.5 to 50 parts by weight of a hydride siloxane cross-linking agent; (C) from 1 to 500 parts per million of a platinum catalyst; and (D) from 0.1 to 5 parts by weight of a self-bonding additive which is the partial hydrolysis product of an aliphatically

unsaturated hydrolyzable alkoxy silane; (2) applying the mixture to said substrate; and (3) heating the substrate and mixture above 100° C. wherein said self-bonding additive is the partial hydrolysis product of a compound of the formula,

$$R_a^1Si(OR^3)_{4-a}$$

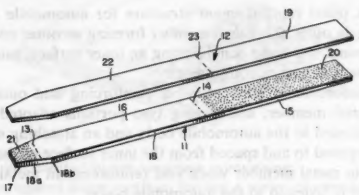
wherein R^1 is an aliphatically unsaturated radical selected from the class consisting of alkenyl radicals and alkynyl radicals of 2 to 8 carbon atoms, R^3 is selected from the class consisting of alkyl radicals and cycloalkyl radicals of 1 to 8 carbon atoms and a is 1; and wherein the partial hydrolysis product is such that on the average 16 to 49 mole percent of the hydrocarboxy groups of said silane are hydrolyzed.

4,311,740

INDENTIFICATION STRIP ASSEMBLY AND METHOD OF USE THEREOF

Paul O. Kay, Barrington, Ill., assignor to Hollister Incorporated, Chicago, Ill.

Filed Jun. 13, 1980, Ser. No. 159,363
Int. Cl.³ B05D *1/28;* B65D *65/28;* G09F *3/20;* B65D *65/32*
U.S. Cl. 427—428 **16 Claims**



1. A method of preparing an identification bracelet utilizing an identification strip assembly and a tubular transparent band adapted to be secured about the limb of a wearer; said strip assembly including a base strip having tip, insert, and handle sections, and also including a cover strip overlying said base strip; said cover strip being secured to said tip and handle sections and being provided with means for producing an image on said insert section when said insert section and cover strip are subjected to localized pressure; said base strip having a first perforation line between said tip and insert sections and a second perforation line between said insert and handle sections, and said cover strip having a perforation line overlying said second perforation line of said base strip; said second perforation line having greater tear resistance than the combined tear resistances of said first perforation line of said base strip and said perforation line of said cover strip; wherein the steps comprise

applying pressure to said insert section and the portion of said cover strip overlying the same to produce an identifying image on said insert section; then abruptly urging apart said tip section and said handle section, along with the respective portions of said cover strip overlying the same, in opposite endwise directions to simultaneously tear said first perforation line of said base strip and said perforation line of said cover strip without tearing said second perforation line of said base strip; then inserting said insert section into a flexible transparent tubular band; and then tearing said second perforation line to separate said handle section and the portion of said cover strip overlying the same from said band while retaining said insert section within said band.

4. An identification strip assembly for use with tubular insert-receiving identification bands, comprising an elongated base strip of imprintable sheet material having a tip section at one end thereof, a handle section at the opposite end thereof, and an insert section disposed therebetween; said sections being delimited by a first perforation line extending transversely between said tip section and said insert section and a second perforation line extending transversely between said insert section and said handle section; and a cover strip overlying said sections and being secured to said tip and handle sections while being unsecured to said insert section; said cover strip having a transverse perforation line adjacent said second perforation line of said base strip; said second perforation line having greater tear resistance than the combined tear resistance of said first perforation line of said base strip and said perforation line of said cover strip; whereby, a user gripping said covered tip section and said covered handle section and then urging the same apart in opposite endwise directions may separate said tip section from said insert section along said first perforation line, and simultaneously separate said cover section along the perforation line thereof, without tearing said base strip along said second perforation line; said cover strip being provided with means for producing an image on said insert section when said insert section and the portion of said cover strip overlying the same are subjected to pressure.

4,311,741

POLYESTER FILMS WITH IMPROVED PROCESSABILITY AND TEAR RESISTANCE

Andrew H. Wong, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 891,599, Mar. 30, 1978, Pat. No. 4,286,011. This application May 19, 1980, Ser. No. 151,415
Int. Cl.³ B65D *41/02, 41/32;* B32B *27/36*
U.S. Cl. 428—35 **2 Claims**

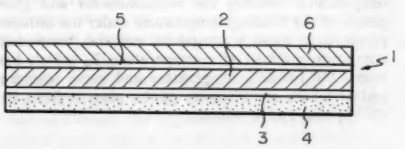
1. A uniaxially oriented, heat set polyester film which comprises a flexible backing member of an adhesive tape, said film comprising the extrusion product of a homogeneous mixture of polyethylene terephthalate resin, and polytetramethylene terephthalate resin, wherein said film comprises 20 to 80 percent by weight polyethylene terephthalate, the remainder of said film comprising polytetramethylene terephthalate, said uniaxial orientation is accomplished by elongating said film along an axis in the range of 2.5× to 3.5×, heat setting is accomplished at in the range of 175° C. to 205° C., and wherein said film has a thickness in the range of 12.5 micrometers to 130 micrometers, said adhesive tape being circumjacent the preformed opening in a container end portion, wherein the axis along which said film is oriented is essentially parallel to the direction of pull for removing an external tape covering preformed opening in the end of a container.

4,311,742

RETORT-STERILIZABLE LAMINATED POUCH COMPRISING A FLEXIBLE GAS-BARRIER SUBSTRATE AND BLENDED CRYSTALLINE OLEFIN LAYER

Yoshiaki Otsuka, Tokyo, Japan, assignor to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Aug. 21, 1980, Ser. No. 179,987
Claims priority, application Japan, Aug. 17, 1979, 54-104046; Aug. 20, 1979, 54-105080
Int. Cl.³ B65D *35/08;* B32B *3/02*
U.S. Cl. 428—35 **6 Claims**



1. A retort-sterilizable laminated pouch having an excellent loading pressure resistance, which comprises two laminated sheets, each comprising a flexible gas-barrier substrate and a heat-sealable crystalline olefin resin layer formed on one surface of said substrate, said laminated sheets being piled in the

form of a pouch where the olefin resin layers confront each other and the periphery of the pouch of the piled sheets being heat-sealed, wherein the crystalline olefin resin layer is composed of a blend comprising (A) polyethylene having a flow ratio (Kp), defined by the following formula, of at least 165:

$$Kp = 100 \log \frac{MI_{20}}{MI_2}$$

wherein MI_2 stands for the melt index (g/10 min) as determined according to the condition E of ASTM D-1238 and MI_{20} stands for the melt index (g/10 min) as determined according to the condition E of ASTM D-1238 except that the load is changed to 20.0 Kg and the sample collecting time is changed to 30 seconds,

and a density of at least 0.935 g/cc and (B) polyethylene having a flow ratio (Kp) not higher than 164 and a density of at least 0.935 g/cc at a mixing weight ratio (A)/(B) of from 90/10 to 50/50.

4,311,743
SEMICONDUCTOR-GLASS COMPOSITE MATERIAL AND METHOD FOR PRODUCING IT

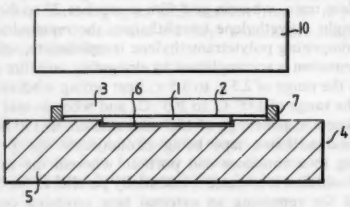
Erich Kasper, Senden, and Suso Weber, Langenau, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 1, 1979, Ser. No. 80,948

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1978, 2842492

Int. Cl.³ B32B *3/02, 17/06;* **C03B** *27/00*

U.S. Cl. 428—64 **9 Claims**



1. Gallium arsenide photocathode comprising a semiconductor-glass composite material produced by combining a semiconductor layer with a disc-shaped glass substrate under conditions of elevated temperature and pressure, wherein said glass substrate and said conditions of temperature and pressure have been selected such that said semiconductor layer of said composite material has a strain $\epsilon \leqq 0.3$ per mil and dislocation density $N_v \leqq 2 \times 10^6$ cm^{-2}.

5. A method for producing a semiconductor-glass composite material, in which at least one semiconductor layer is permanently bonded to a glass substrate, wherein the semiconductor layer has a strain $\epsilon \leqq 0.3$ per mil and a dislocation density of $N_V \leqq 2 \times 10^6$, comprising:

heating the semiconductor and glass together to a bonding temperature; bonding the semiconductor and glass together at the bonding temperature under the influence of pressure, to form a composite material; tempering the composite material at a temperature T_a which lies between the bonding temperature and room temperature, and at which the viscosity of the glass is from 10^{12} to $10^{13.5}$ poise, and at which

$$\left| \int_{T=25^\circ C.}^{T=T_a} [\alpha_G(T) - \alpha_S(T)]\, dT \right| < 3 \times 10^{-4}$$

wherein α_G and α_S are the coefficients of expansion of the glass and semiconductor, respectively, and T is temperature; and subsequently cooling the composite material to room temperature.

4,311,744
PANEL REINFORCEMENT STRUCTURES FOR AUTOMOBILE BODIES

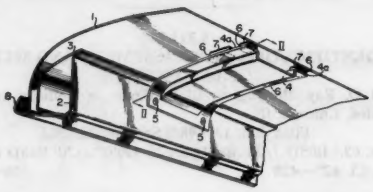
Kinji Watanabe, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Feb. 26, 1980, Ser. No. 124,922

Claims priority, application Japan, Feb. 28, 1979, 54-23727

Int. Cl.³ B32B *15/08, 15/04, 3/06*

U.S. Cl. 428—83 **10 Claims**



1. A panel reinforcement structure for automobile bodies having an outer skin metal member forming an outer covering body panel, the body panel having an inner surface, said reinforcement structure comprising:

a reinforcement metal member reinforcing said outer skin metal member, and having two portions adapted to be fastened to the automobile body and an attaching surface opposed to and spaced from the inner surface of the outer skin metal member when said reinforcement metal member is fastened to the automobile body;

a filler agent layer between the inner surface of the outer skin metal member and the attaching surface of the reinforcement metal member;

a layer of foamed material between the filler agent layer and at least one of the outer skin metal member and the reinforcement metal member; and

a corrosion resistant coating layer formed on the inner surface of the outer skin member by electrodeposition material, said layer of foamed material having open cell structure so that electrodeposition material can reach the inner surface of the outer skin member.

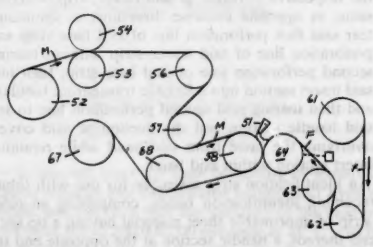
4,311,745
LAMINATING

Frank P. Civardi, Wayne, N.J., assignor to Inmont Corporation, Clifton, N.J.

Continuation of Ser. No. 834,857, Sep. 19, 1977, abandoned. This application Nov. 26, 1979, Ser. No. 97,174

Int. Cl.³ B32B *31/26*

U.S. Cl. 428—91 **16 Claims**



1. Process for laminating a microporous flexible solid sheet material having a specific gravity of at least 0.3 to a fibrous

fabric which comprises supplying said sheet material in a form having a surface layer at least 0.1 mm thick having an overall specific gravity less than 0.2, applying heat to said surface layer by bathing it in a flame to fuse material of said surface layer and then pressing said fused material against said fibrous fabric to embed fibers of said fabric into said fused material to form a flexible laminate in which the bond between said fibrous fabric and said microporous material has high moisture vapor transmission.

4,311,746

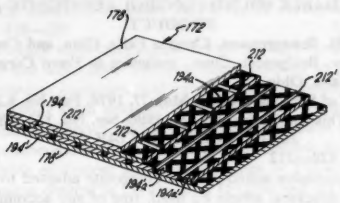
CORRUGATED PAPER BOARD

Marc A. Chavannes, 7356 Point of Rocks Rd., Sarasota, Fla. 33581

Continuation-in-part of Ser. No. 878,158, Feb. 15, 1978, Pat. No. 4,232,074, which is a continuation-in-part of Ser. No. 599,142, Jul. 25, 1975, Pat. No. 4,203,790. This application Nov. 16, 1979, Ser. No. 94,833

Int. Cl.³ B32B *3/28, 5/10*

U.S. Cl. 428—110 **12 Claims**



1. A corrugated paper structure comprising:

a corrugated paper medium having a series of crests;

a paper liner adhered to the crests of one side of said corrugated paper medium with a water-based emulsion adhesive; and

at least one of said corrugated paper medium and said paper liner being comprised of a laminated paper structure, said at least one laminated paper structure in turn comprising first and second paper layers arranged in overlying relationship, and a hot melt adhesive interposed between the facing surfaces of said first and second paper layers for adhesively securing said first and second paper layers together, said hot melt adhesive being on less than the entire areas of said facing surfaces of said first and second layers to provide a first adhesive coated section and a second uncoated section, said first adhesive coated section being of a size sufficient to adhesively secure said first and second paper layers together, and said second uncoated section being of a size sufficient to permit evaporation of water between said first and second paper layers across said facing surfaces thereof.

11. A corrugated paper structure comprising:

a corrugated paper medium having a series of crests, said corrugated paper medium comprising a first pair of paper layers arranged in overlying relationship to one another, a first plurality of wires interposed between said paper layers of said first pair, and a first hot melt adhesive interposed between said paper layers of said first pair, said first hot melt adhesive adhesively securing said wires of said first plurality to at least one of the surfaces of said paper layers of said first pair and adhesively securing said first pair of paper layers together, said first pair of paper layers with said wires of said first plurality adhesively secured therebetween being corrugated transversely of said wires of said first plurality; and

at least one paper liner adhered to the crests of one side of said corrugated paper medium with a water based emulsion adhesive, said at least one paper liner being comprised of a second pair of paper layers arranged in overlying relationship to one another, a second plurality of wires interposed between said paper layers of said second pair, and a second hot melt adhesive interposed between said paper layers of said second pair, said second hot melt adhesive adhesively securing said wires of said second plurality to at least one of the surfaces of said paper layers of said second pair and adhesively securing said second pair of paper layers together, said second hot melt adhesive being on less than the entire areas of the facing surfaces of said paper layers of said second pair to provide an adhesive coated section and an uncoated section, said adhesive coated section of said second pair of paper layers being of a size sufficient to adhesively secure said paper layers of said second pair together and said uncoated section of said second pair of paper layers being of a size sufficient to permit evaporation of water through said paper layers of said second pair.

4,311,747

CHANNEL-SHAPED SEALING AND FINISHING STRIPS

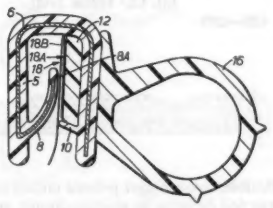
Werner Kruschwitz, Viersen, Fed. Rep. of Germany, assignor to Draftex Development AG, Zug, Switzerland

Continuation of Ser. No. 947,113, Sep. 29, 1978, abandoned. This application Feb. 4, 1980, Ser. No. 118,329

Claims priority, application United Kingdom, Oct. 4, 1977, 41092/77

Int. Cl.³ E06B *7/23*

U.S. Cl. 428—122 **5 Claims**



1. A flexible channel-shaped sealing strip, comprising

channel-shaped flexible material,

a supporting carrier of metal embedded in the flexible material,

the flexible material defining respective gripping ribs running along opposite inside walls of the channel close to the open mouth of the channel for gripping and sealing against opposite side faces of a flange which the channel embraces in use,

a length of solid unvulcanized rubber running on and along the length of the interior surface of one side wall of the channel and between the respective gripping rib on that wall and the base of the channel, the thickness of the rubber across the width of the channel being less than the extension of that rib across the width of the channel so that the rib protects the outermost side of the rubber when the sealing strip is placed on the said flange,

the length of solid unvulcanized rubber having a free and inherently tacky surface facing across the interior of the channel towards the opposite inside wall thereof, the free surface in use making contact with and adhering to at least part of one said side face of the flange so as to seal to and grip the said side face, the area of the said part of one said side face of the flange being a substantial proportion of the total area of the portion of that side face which is within the said channel, and

a sealing section of soft material running along and attached to the outside surface of the channel.

4,311,748

NO-OVERLAY DECORATIVE LAMINATES

Donald J. Casey, Ridgefield, Conn., and Daniel M. Zavisza, Basking Ridge, N.J., assignors to Formica Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 46,140, Jun. 6, 1979, abandoned. This application Oct. 20, 1980, Ser. No. 202,044
Int. Cl.[3] B32B *3/00, 27/08, 29/00*
U.S. Cl. 428—204 9 Claims

1. A heat and pressure consolidated laminate consisting essentially of, in superimposed relationship,

(a) a core layer consisting of a self-supporting substrate;

(b) a print layer consisting of an opaque alpha cellulose paper sheet impregnated with a melamine-formaldehyde thermoset resin, and

(c) a surface coating located upon the print layer of a hydrolyzed polyvinyl alcohol modified melamine-formaldehyde resin wherein the hydrolyzed polyvinyl alcohol has a degree of hydrolysis equal to or greater than about 99.0 percent of the acetate groups wherein the surface coating weight is from about 60 to about 140 grams per square meter and the amount of hydrolyzed polyvinyl alcohol in the surface coating is from about 5 to 30 percent by weight of the total weight of the melamine-formaldehyde reaction product solids.

4,311,749

FLAME-PROOF FLEXIBLE PRINTED CIRCUIT BOARD

Takashi Hiraiwa, Anjo, and Yuichi Fujita, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 28, 1978, Ser. No. 937,198
Claims priority, application Japan, Sep. 6, 1977, 52-106905
Int. Cl.[3] H05K *1/00*
U.S. Cl. 428—209 13 Claims

1. A flexible, fire-resistant printed circuit board comprising a copper foil defining an electric circuit, and

a flexible resin film adhered to one surface or both surfaces of said copper foil with an adhesive, said flexible resin film selected from the group consisting of polyester, polyvinyl chloride, polypropylene, polyethylene, polyamide and polyimide,

wherein said flexible resin film prior to adherence being subjected to a surface treatment to provide a surface tension of from 36 to 60 dynes/cm thereon, and a resin film containing a flame retardant is then formed on the treated surface of said flexible resin film.

4,311,750

THERMO-SENSITIVE MULTI-COLOR RECORDING MATERIAL AND PROCESS FOR PREPARATION THEREOF

Keishi Kubo, Yokohama, and Tetsuo Tanaka, Mishima, both of Japan, assignors to Ricoh Company Limited, Tokyo, Japan

Filed Dec. 4, 1979, Ser. No. 100,067
Claims priority, application Japan, Dec. 14, 1978, 53-153695
Int. Cl.[3] B41M *5/18*
U.S. Cl. 428—212 9 Claims

1. In a multi-color thermo-sensitive recording material comprising a support material carrying, in the following order, a lower thermo-sensitive coloring layer, a decoloring layer and an upper thermo-sensitive coloring layer, said lower thermo-sensitive coloring layer being capable of forming a first color at a first temperature, said upper thermo-sensitive coloring layer being capable of forming a second color at a second temperature which is lower than said first temperature, said second color being different from said first color, and said decoloring layer is capable of decoloring said upper thermo-sensitive coloring layer in such a manner that the color of said upper thermo-sensitive coloring layer does not overlap the color of said lower thermo-sensitive coloring layer, the improvement which comprises:

(i) said upper thermo-sensitive coloring layer comprises a colorless or light-colored leuco dye color former, an acidic color developer and a binder material;

(ii) said decoloring layer comprises a decoloring agent capable of decoloring said upper thermo-sensitive coloring layer when said upper thermo-sensitive layer is heated to said first temperature, and a cross-linking type resin which is cross-linked in the course of the coating of said layers;

(iii) said lower thermo-sensitive coloring layer contains a color former and a color developer, which form a color different from the color formed by said upper thermo-sensitive coloring layer.

4,311,751

MOLDABLE SOUND CONTROL COMPOSITE AND PRODUCT

Walter H. Brueggemann, Chagrin Falls, Ohio, and Charles L. Meteer, Bridgeport, Conn., assignors to Ferro Corporation, Cleveland, Ohio

Division of Ser. No. 690,796, May 27, 1976, Pat. No. 4,237,176. This application Jan. 21, 1980, Ser. No. 114,118
Int. Cl.[3] C08L *63/00;* C04B *43/00*
U.S. Cl. 428—212 1 Claim

1. A moldable sound control composite adapted to form a molded structural article by itself, free of any accompanying support, and combining damping, barrier performance, and structural strength, said composite being further adapted for use within a predetermined environmental temperature range, said composite in weight percent a blend of from about 10% to about 60% of a primary organic polymeric resinous material that is non-viscoelastic within said temperature range to impart a structural strength, from about 40% to about 90% of a secondary organic resinous polymeric material that is viscoelastic within said temperature range to provide damping performance, and from about 10% to about 60% of a filler material adapted to densify the composite and impart barrier performance, said composite having a specific gravity within the range of about 1.0 to about 7.0 and, by virtue of said blend, a glass transitional temperature range generally corresponding to said predetermined environmental temperature range and a maximum loss factor, n, falling within said environmental range, and in which said primary non-viscoelastic organic resinous material is Bisphenol A-epichlorohydrin epoxy resin, and said secondary viscoelastic organic resinous material is polyethylene.

4,311,752

ETHYLENE COPOLYMERS AND THEIR USE FOR THE MANUFACTURE OF FILMS

Bernd Diedrich, Eschborn; Ludwig Böhm, Mainz, and Olaf Heine, Königstein/, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 2,867, Jan. 11, 1979, abandoned. This application Nov. 13, 1979, Ser. No. 93,884
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1978, 2801541
Int. Cl.[3] C08F *10/02*
U.S. Cl. 428—220 3 Claims

1. A copolymer of ethylene containing from 94.5 to 99.5 weight % of ethylene units and from 0.5 to 5.5 weight % of 1-olefin units of the formula R—CH=CH_2,in which R is an alkyl radical having from 1 to 6 carbon atoms, said copolymer having a density of from 0.935 to 0.945 g/cm^3, a melt index MFI 190/5 of from 0.05 to 0.2 g/10 min., a melt index ratio

$\frac{MFI\ 190/15}{MFI\ 190/5}$ greater than 8,

a shear viscosity of from $4 \cdot 10^5$ to $4 \cdot 10^6$ Pa . s, at 200° C. and at a shear stress of 10^2 N/m^2, a shear viscosity of from $6 \cdot 10^3$ to $1 \cdot 10^5$ Pa . s at 200° C. and at a shear stress of 10^5 N/m^2, a tear strength above 25 N/mm^2, an elongation at break above 600%, a tear initiation resistance above 150 N/mm, a tear propagation resistance above 100 N/mm, and an impact strength above 2500 mJ/mm^2.

4,311,753

CURING AGENT FOR EPOXY RESIN LAMINATING COMPOSITIONS COMPRISING A MIXTURE OF DICYANDIAMIDE AND A TETRA-ALKYLGUANIDINE

Donald G. Pucci, West Lafayette, Ohio, assignor to General Electric Company, Coshocton, Ohio

Filed Jul. 17, 1979, Ser. No. 58,193

Int. Cl.[3] **B32B** *17/04;* **C08G** *59/18, 59/38, 59/46, 59/56*

U.S. Cl. 428—251 **4 Claims**

1. An epoxy resin composition for preparing storage-stable prepregs and multi-layer bonding sheets adapted to produce flame retardant laminates, said composition comprising

(a) an epoxy resin mixture of (i) from 70 to 90 parts of a brominated epoxy resin comprising the reaction product of tetrabromobisphenol-A and epichlorohydrin having an epoxide equivalent weight in the range of 370–430 and a bromine content in the range of 15–22% and (ii) from 10 to 30 parts of a tetrafunctional epoxy resin comprising the reaction product of tetra-bis(hydroxyphenyl)ethane having an epoxide equivalent weight in the range of 210–240;

(b) an effective amount of dicyandiamide as a curing agent;

(c) from about 0.01 to 1.0 parts per part of said dicyandiamide of a tetraalkylguanidine as a catalyst; and

(d) a suitable solvent.

3. As an article of manufacture, a glass fabric impregnated with an epoxy resin composition comprising:

(a) an epoxy resin mixture of (i) from 70 to 90 parts of a brominated epoxy resin comprising the reaction product of tetrabromobisphenol-A and epichlorohydrin having an epoxide equivalent weight in the range of 370–430 and a bromine content in the range of 15–22% and (ii) from 10 to 30 parts of a tetrafunctional epoxy resin comprising the reaction product of tetra-bis(hydroxyphenyl)ethane having an epoxide equivalent weight in the range of 210–240;

(b) an effective amount of dicyandiamide as a curing agent;

(c) from about 0.01 to 1.0 parts per part of said dicyandiamide of a tetraalkylguanidine as a catalyst.

4,311,754

PROCESS FOR HYDROGENATION OF 2,6,6-TRIMETHYL CYCLOHEXENE DERIVATIVES AND ORGANOLEPTIC USES OF SAID PRODUCTS

Robert W. Trenkle, Bricktown; Braja D. Mookherjee; Frederick L. Schmitt, both of Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

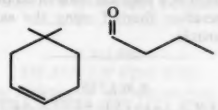
Division of Ser. No. 969,852, Dec. 15, 1978, Pat. No. 4,292,447. This application Feb. 27, 1981, Ser. No. 239,051

Int. Cl.[3] **B32B** *33/00;* **D04H** *1/40*

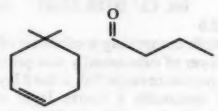
U.S. Cl. 428—284 **2 Claims**

1. A dryer added fabric softener article comprising a substrate, coated on said substrate a coating and coated on said substrate coating an outer coating and intimately admixed with said outer coating at least one substance selected from the group consisting of:

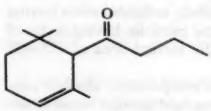
(i) the compound having the structure:

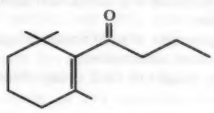


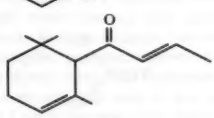
(ii) the compound having the structure:

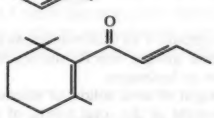


(iii) a mixture of compounds having the structures:

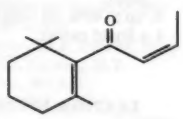






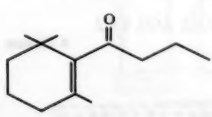


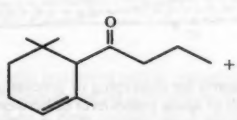
and

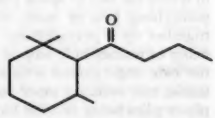


and

(iv) a mixture of compounds having the structures:







said substance being in such an amount that when the dryer-

added fabric softener article is contacted with a clothing batch an aroma is imparted in a pleasant manner to the head space in the dryer on operation thereof using the said dryer-added fabric softening article.

4,311,755
NON-STICK COATED STEEL ARTICLE

Mitzie K. Rummel, Secane, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 29, 1980, Ser. No. 220,951
Int. Cl.³ B32B *27/00*
U.S. Cl. 428—312.6 **7 Claims**

1. A coated article comprising a substrate of steel on which is applied a first layer of substantially non-porous ceramic frit, a second layer of porous ceramic frit, a third layer of fluorocarbon primer, and optionally a fourth layer of fluorocarbon topcoat, wherein said primer is derived from a coating composition consisting essentially of:

a. 20–90%, by weight of total solids, a particulate fluorocarbon polymer;

b. 10–80%, by weight of total solids, colloidal silica having a pH of 8.4–9.9 at 25° C., whose particles having a size of 5–100 millimicrons and specific surface area of 125–420 square meters per gram;

c. 1.5–3.5%, by weight of total composition, alcohol containing 4 or more carbon atoms, said alcohol being miscible with water;

d. 1.0–1.5%, by weight of total composition, fatty acid containing 8 or more carbon atoms;

e. 0.3–0.7%, by weight of total composition, amine having the formula

wherein R_1 contains 1 to 6 carbon atoms and may contain other functional groups, and R_2 and R_3 contain one to six carbon atoms or hydrogen;

f. 1–4%, by weight of total solids, of silicone resins,

g. 1–4%, by weight of the total solids, of a polymeric adjunct;

h. up to 40%, by weight of the tortal solids, of pigment; and

i. a liquid carrier.

4,311,756
LEATHER BELTS OR APRONS FOR TEXTILE MACHINES

Wallace R. Brooksbank, Embsay Tannery, Skipton, County of York, England

Filed Dec. 18, 1980, Ser. No. 217,835
Claims priority, application United Kingdom, Dec. 18, 1979, 43467/79
Int. Cl.³ B32B *3/00, 3/02, 5/20, 9/02*
U.S. Cl. 428—282 **4 Claims**

1. A belt or apron for conveying or processing textile fibres in which the belt or apron passes over or between fluted rollers comprising two or more plies or layers adhesively bonded together by a polyurethane adhesive, the inner ply or layer being of leather hide having a surface of the fleshy portion of the hide impregnated with a polymeric material to provide a stable, tear resistant inner surface and the other outer surface ply or plies being of a felt like material capable of being flexed or stretched without premature cracking or rupture.

2. A belt or apron as in claim 1 in which the outer ply or layer is of a felt impregnated or reinforced with polyurethane foam.

4,311,757
DECORATIVE METALLIC LAMINATES

Ram S. Raghava, Ann Arbor, Mich., and Wilbur W. West, Cincinnati, Ohio, assignors to Formica Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 46,142, Jun. 6, 1979, abandoned. This application Oct. 30, 1980, Ser. No. 202,109
Int. Cl.³ B32B *5/16, 27/08, 29/00*
U.S. Cl. 428—323 **11 Claims**

1. A heat and pressure consolidated laminate consisting essentially of, in superimposed relationship,

(a) a core layer consisting of a self-supporting substrate;

(b) a surface coating of a hydrolyzed polyvinyl alcohol modified melamine-formaldehyde resin containing a finely divided metallic powder or pigment wherein the hydrolyzed polyvinyl alcohol has a degree of hydrolysis equal to or greater than about 99.0 percent of the acetate groups and wherein the surface coating weight is from about 60 to 140 grams per square meter, the amount of hydrolyzed polyvinyl alcohol in the surface coating is from about 5 to 30 percent by weight of the total weight of the melamine-formaldehyde reaction porduct solids and the amount of metallic powder is from about 2 to 8 percent by weight of the total weight of the melamine-formaldehyde reaction product solids.

9. A method of producing a heat and pressure consolidated laminate which comprises:

(a) positioning a laminate assembly between press plates, said laminate assembly consisting essentially of, in superimposed relationship,

(1) a core layer consisting of a self-supporting substrate; and

(2) a surface coating of a hydrolyzed polyvinyl alcohol (PVA) having a degree of hydrolysis equal to or greater than about 99.0 percent of the acetate groups modified melamine-formaldehyde resin containing finely divided metallic powders or pigment wherein the surface coating weight is from about 60 to 140 grams per square meter and the amount of hydrolyzed PVA in the surface coating is from about 5 to about 30 percent by weight of the total weight of the melamine-formaldehyde reaction product solids;

(b) applying sufficient temperature and pressure to the laminate assembly to cure the resins impregnating the laminate assembly, thereby providing the laminate; and

(c) recovering the resultant laminate.

4,311,758
HEAT-SENSITIVE RECORD MATERIAL

Yoshitaka Oeda, Nara; Takeshi Murakami, Osaka; Hiroo Hayashi, Kyoto, and Teruo Nakamura, Osaka, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Hyogo, Japan

Continuation of Ser. No. 12,434, Feb. 15, 1979, abandoned, which is a continuation of Ser. No. 867,342, Jan. 5, 1978, Pat. No. 4,168,845. This application Dec. 1, 1980, Ser. No. 211,780
Claims priority, application Japan, Jan. 7, 1977, 52-980
Int. Cl.³ B32B *5/16*; B41M *5/18*
U.S. Cl. 428—341 **10 Claims**

1. In a heat-sensitive record material comprising a base sheet and a color developing layer formed on at least one surface of said base sheet, said color developing layer comprising colorless chromogenic material and acceptor which is reactive with said colorless chromogenic material to develop a color, the improvement in said color developing layer further including pigment having an oil absorption within the range of 100 to 400 ml/100 g., said pigment being a member selected from the group consisting of diatomaceous earth, calcined diatomaceous earth, flux-calcined diatomaceous earth, finely-divided aluminum oxide anhydride, finely divided titanium dioxide,

white carbon, magnesium aluminosilicate, magnesium oxide and mixtures of the foregoing.

4,311,759

PRESSURE SENSITIVE ADHESIVES

Alfred E. Glennon, Anaheim, Calif., assignor to International Coatings Co., Inc., Cerritos, Calif.

Division of Ser. No. 965,800, Dec. 4, 1978, Pat. No. 4,243,500, which is a continuation-in-part of Ser. No. 873,869, Jan. 31, 1978, abandoned. This application Jul. 14, 1980, Ser. No. 168,620

Int. Cl.[3] **C09J** *7/02;* **C08F** *2/50*

U.S. Cl. 428—345 **10 Claims**

1. The combination consisting of a substrate, and a layer of pressure sensitive adhesive adhered to said substrate and formed by the method that comprises:

providing a composition including mono-functional unsaturated acrylate ester monomer, essentially saturated thermoplastic tackifying resin polymer dissolved in said acrylate ester monomer, non-crystallizing elastomeric block copolymer dissolved in said acrylate ester monomer, and initiator responsive to radiation;

subjecting said composition to radiation to which said initiator is responsive; and

inducing copolymerization of said acrylate ester monomer and said non-crystallizing elastomeric block copolymer by said initiator.

4,311,760

METHOD FOR APPLYING MERCAPTOALKYL-CONTAINING POLYDIORGANOSILOXANES TO TEXTILE FIBERS

Robert E. Kalinowski, Auburn, and Jonathan Lipowitz, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 729,498, Oct. 4, 1976, abandoned, which is a continuation-in-part of Ser. No. 689,395, May 24, 1976, abandoned. This application Aug. 8, 1977, Ser. No. 822,474

Int. Cl.[3] **B32B** *25/02, 25/20;* **B05D** *3/02*

U.S. Cl. 428—391 **11 Claims**

1. A method for treating a condensation-polymer fiber or a cellulosic fiber which comprises applying to said fibers a liquid composition consisting essentially of a polydiorganosiloxane having a viscosity of at least 20 millipascal-seconds at 25° C., said polydiorganosiloxane consisting essentially of

(A) siloxane units of the unit formula

$$R_nSi(OR'')_mO_{(4-m-n)/2}$$

wherein m=0, 1 or 2, n=1, 2 or 3, and the sum of m+n=2 or 3, R denotes a silicon-bonded radical free of aliphatic unsaturation selected from the group consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals, and R'' denotes a lower alkyl radical and,

(B) siloxane units of the unit formula

$$HSR'SiR_x(OR'')_yO_{(d-x-y)/2}$$

wherein R and R'' are as denoted above, R' denotes a divalent saturated hydrocarbon radical having one valence bonded to the silicon atom and one valence bonded to the sulfur atom or a trivalent saturated hydrocarbon radical having two valences singly bonded to the silicon atom and one valence bonded to the sulfur atom, the values of d, x and y being such that when R' is divalent d=3, x=0, 1 or 2, y=0, 1 or 2 and the sum of x+y=1 or 2 and when R' is trivalent d=2, x=0 or 1, y=0 or 1 and the sum of x+y=0 or 1, there being an average of at least one HSR'—radical in addition to at least one —OR'' radical or another HSR'—radical in the polydiorganosiloxane and heating the applied polydiorganosiloxane whereby there is obtained a fiber having durably affixed to the surface thereof a crosslinked polydiorganosiloxane.

4,311,761

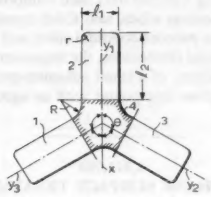
FILAMENT FOR WIG

Youichi Kanbara, Kakogawa, and Shunichiro Kurioka, Kobe, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 4, 1980, Ser. No. 184,019

Int. Cl.[3] **D02G** *3/00*

U.S. Cl. 428—397 **6 Claims**



1. Artificial human hair particularly adapted for use in wigs and made of a filament for use in a wig, comprising in cross section, a center portion and three substantially rectangular portions extending outwardly from said center portion, said rectangular portions having a lateral dimension and a transverse dimension and a center line, said center portion having at substantially its center an axis extending the length of said filament with said center lines of said rectangular portions extending outwardly to form an angle between two adjacent ones of said rectangular portions, wherein the ration of said lateral dimension to said transverse dimension is between 1 to 3, wherein the cross sectional area of said center portion is from $\sqrt{3}/12$ to 1.5 times the total cross sectional areas of said three rectangular portions, and wherein said artificial human hair has the properties of maintenance of tight curls and bulkiness.

4,311,762

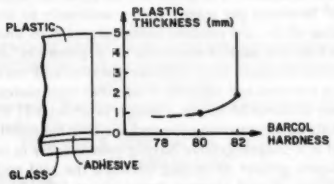
PLASTIC COMPONENTS OF IMPROVED HARDNESS AND SCRATCH RESISTANCE

Anton A. Spycher, Big Flats, N.Y., and Dennis J. Damico, Erie, Pa., assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 24, 1980, Ser. No. 200,533

Int. Cl.[3] **B32B** *17/10, 27/36;* **G02C** *7/10*

U.S. Cl. 428—412 **7 Claims**



1. A glass plastic laminated article comprising at least one direct-cast diethylene glycol bis(allyl carbonate) plastic surface element bonded to a glass element by a polymeric bonding layer, wherein the plastic surface element exhibits a Barcol hardness of at least about 77 at all regions spaced 1 mm or greater from the polymeric bonding layer, said plastic surface element having been polymerized from a monomer-catalyst mixture including, as the catalyst, 1–9% of isopropyl percarbonate, 0.5–6% of benzoyl peroxide, and 3.5–13% total of isopropyl percarbonate and benzoyl peroxide by weight.

4,311,763

SILICONE RESIN COATING COMPOSITION

James T. Conroy, Green Island, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jul. 18, 1980, Ser. No. 170,994
Int. Cl.[3] B32B *9/04, 13/12*
U.S. Cl. 428—412 23 Claims

1. In an aqueous coating composition comprising a dispersion of colloidal silica in an aliphatic alcohol-water solution of the partial condensate of a silanol of the formula $RSi(OH)_3$, wherein R is selected from the group consisting of alkyl having from 1 to 3 carbon atoms and aryl, at least 70 weight percent of the silanol being $CH_3Si(OH)_3$, said composition containing 10 to 50 weight percent solids, said solids consisting essentially of 10 to 70 weight percent colloidal silica and 30 to 90 weight percent of the partial condensate, the improvement comprising the intimate admixture of a small adhesion-promoting amount of a β-hydroxyketone compound with an aged such composition.

4,311,764

POLYURETHANE SURFACE TREATMENT AND RESULTING MONOMOLECULAR LAYERED ARTICLE

Helmut Franz, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 1, 1980, Ser. No. 192,761
Int. Cl.[3] B32B *27/40*
U.S. Cl. 428—423.1 10 Claims

8. A polyurethane article having a lubricating nonreactive surface layer prepared by the chemisorption of a carboxylated fluorosurfactant at the polyurethane surface.

4,311,765

POLYURETHANE SHOCK ABSORBING UNIT AND SAID POLYURETHANE

Daniel A. Chung, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 28, 1980, Ser. No. 172,622
Int. Cl.[3] B32B *27/40;* B61G *9/06*
U.S. Cl. 428—425.8 2 Claims

1. Shock absorbing unit which comprises a shaped resilient polyurethane composition characterized by (A) withstanding compressive cycling at least 4000 cycles under constant compression alternating between a maximum of about 45 to about 55 percent and a minimum of about 8 to about 12 percent of its original uncompressed height, (B) requiring at least about 37×10^6 Newtons per square meter to compress said unit 55 percent of its original uncompressed height after 4000 cycles of said compressive cycling, and (C) deflecting from about 1.8 to about 2.0 centimeters at about 25° C. upon the application of 45×10^6 Newtons per square meter uniformly to the end surface areas of the said resilient compositions in its uncompresed state when the said composition is a generally disc-shaped cylindrical element with circular parallel end surfaces, said surfaces covered and adhered to circular steel plates, having a diameter of about 16.51 cm, a height of about 3.81 centimeters and a sidewall connecting the end surfaces substantially in the form of a V-shaped groove having substantially in the form of a V-shaped groove extending between the said end surfaces, the volume of said element being about 150 percent of the volume of the said groove, where said resilient shock absorbing polyurethane composition is prepared by the method which comprises reacting a polyurethane having improved shock absorbing ability after 4000 cycles of compression at loads of 37×10^6 Newtons per square meter formed by reacting 1,5-naphtalene diisocyanate with a blend of 15 to 25 parts of a polytetramethylene ether glycol haviang a molecular weight of about 1000 ± 100 and 35 to 45 parts of a polytetramethylene ether glycol having a molecular weight of 2000 ± 100 and 35 to 45 parts of a polycaprolactone ester polyol having a molecular weight of 2000 ± 100 to form a prepolymer having an isocyante content of 3.2–4.0% and curing said prepolymer with a blend of bis(betahydroxyethyl) hydroquinone ether and trimethylol propane.

4,311,766

RELEASE COATINGS

John A. Mattor, Bar Mills, Me., assignor to Scott Paper Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 78,411, Sep. 24, 1979. This application Oct. 2, 1980, Ser. No. 193,193
Int. Cl.[3] B05D *3/06*
U.S. Cl. 428—514 18 Claims

1. In a method of forming a plastic sheet or film on or against an easy release surface, setting the plastic sheet or film and stripping it from the release surface, the improvement wherein the release surface is provided by a substrate coated on at least one side with a non-polysiloxane containing coating composition comprising an acrylic functional material which has been polymerized on the substrate by electron beam radiation.

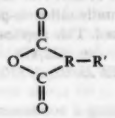
4,311,767

GYPSUM WALLBOARD AND METHOD FOR PRODUCING SAME

Arthur E. Kennedy, North Tonawanda, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Filed Feb. 25, 1980, Ser. No. 124,106
Int. Cl.[3] B32B *21/04*
U.S. Cl. 428—537 10 Claims

1. Paper-covered gypsum board which comprises a gypsum core and a paper cover sheet covering at least one side of said core, said paper cover sheet having a synthetic size applied to the paper surface adjacent said core, said synthetic size being of the group consisting of (1) a cyclic dicarboxylic acid anhydride corresponding to the structural formula



wherein R is selected from the class consisting of dimethylene and trimethylene radicals and wherein R' is a long hydrophobic side chain and is selected from the class of alkyl, alkenyl, aralkyl and aralkenyl groups and (2) the reaction product of maleic acid anhydride and an internal olefin in an amount sufficient to attain in said sheet, when said board is manufactured, a Cobb value of about 0.4 to 1.0 gram as measured on the surface of said sheet adjacent said core.

4,311,768

PRINTED CIRCUIT BOARD HAVING MUTUALLY ETCHABLE COPPER AND NICKEL LAYERS

Betty L. Berdan, and Betty M. Luce, both of Willowick, Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Division of Ser. No. 863,109, Dec. 22, 1977, Pat. No. 4,190,474. This application Sep. 19, 1979, Ser. No. 77,051
Int. Cl.[3] B32B *15/08*
U.S. Cl. 428—626 3 Claims

1. A readily etchable printed circuit board comprising a resinous substrate having bonded to at least one surface thereof a composite metal structure including a layer of copper foil having opposed first and second surfaces and a thin layer of nickel having opposed first and second surfaces with one of said surfaces of said copper foil being bonded to and in direct contact with one of said surfaces of said nickel layer and the opposite opposed surface of said nickel layer being bonded to said resinous substrate, said nickel layer containing an effective amount of sulfur to render said copper foil and said nickel barrier layer mutually etchable.

4,311,769

MERCURY CONTACT

Oleg M. Andreev, 3 Frunzenskaya ulitsa, 14, kv. 7; Anatoly V. Zakurdaev, Proletarsky prospekt, 79, kv. 66, and Vladimir Vyzhimov, ulitsa Vostrukhina, 6, korpus 2, kv. 48, all of Moscow, U.S.S.R.

Filed Mar. 13, 1979, Ser. No. 20,081
Int. Cl.[3] H01H *1/08*
U.S. Cl. 428—642 1 Claim

1. An electric switching device comprising a mercury contact having a solid metal base of antimony wetted with mercury, wherein the antimony base is electrochemically stable and inert with respect to the mercury.

4,311,770

NOVEL FERROMAGNETIC CHROMIUM DIOXIDE AND RHODIUM DIOXIDE MATERIAL AND ITS PREPARATION

Gerard Demazeau, Gradignan; Patrick Maestro, Le Bouscat; Theophile Plante, Merignac; Michel Pouchard, Pessac, and Paul Hagenmuller, Talence, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Sep. 22, 1978, Ser. No. 945,007
Claims priority, application France, Oct. 4, 1977, 77 29857; Aug. 18, 1978, 78 24192
Int. Cl.[3] C01G *37/027*
U.S. Cl. 428—694 59 Claims

1. A process for obtaining, under controlled temperature and pressure reaction conditions, a ferromagnetic chromium dioxide and rhodium dioxide material in solid-solution form and having the formula

$$Cr_{1-x}Rh_xO_2,$$

wherein x is a number between 0 and 0.5, the process comprising:

oxidizing a chromium oxide starting compound at a temperature of at least 350° C., under a pressure of at least 400 bars and in a reaction medium comprising:

(1) a rhodium III compound which is capable of yielding RhO_2 in situ under the reaction conditions and

(2) an oxidizing agent which is an oxygenated compound with an oxidation number greater than +IV and having, under said reaction conditions, a partial oxygen pressure at least equal to those, under the same reaction conditions, corresponding to the equilibria:

$$Cr_2O_3+0.5O_2 \rightleftarrows 2CrO_2$$

and

$$Rh_2O_3+0.5O_2 \rightleftarrows 2RhO_2;$$

the chromium oxide starting compound being a member selected from the group consisting of hydrated Cr_2O_3, anhydrous Cr_2O_3 and a precursor of Cr_2O_3; and

the oxygenated compound being free from metallic cations other than chromium and not leading to the preferential or parasitic formation of chromates, of bichromates or of any other chromium compound.

52. A ferromagnetic solid solution of the formula

$$Cr_{1-x}Rh_xO_2$$

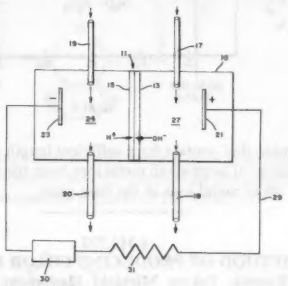
wherein x is a number between about 0.0001 and 0.5.

4,311,771

PROCESS FOR PRODUCTION OF ELECTRICAL ENERGY FROM THE NEUTRALIZATION OF ACID AND BASE IN A BIPOLAR MEMBRANE CELL

James F. Walther, Skaneateles, N.Y., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 972,129, Dec. 21, 1978. This application Sep. 2, 1980, Ser. No. 183,483
Int. Cl.[3] H01M *2/38*
U.S. Cl. 429—51 12 Claims



1. A process for the spontaneous production of electrical energy from the neutralization of acid and base in a cell with a bipolar membrane having a cation-permselective face and an anion-permselective face, said membrane being positioned between two energy-supplying electrodes in electrical connection with one another, said connection having an electrical receiving means to receive electrical energy from said electrodes, which comprises the steps of:

(a) simultaneously contacting an aqueous acid stream with said cation-permselective face of said bipolar membrane and an aqueous base stream with said anion-permselective face of said bipolar membrane whereby the contact of said acid and said base streams through said faces of said bipolar membrane spontaneously produces a neutralization electrical potential difference between said streams;

(b) transmitting said neutralization potential difference to the energy-supplying electrodes which are thereby driven to supply an electrode potential difference which enhances said neutralization potential difference; and

(c) and withdrawing an enhanced electrical energy spontaneously produced thereby from said electrodes through said electrical connecting means to said electrical receiving means.

4,311,772

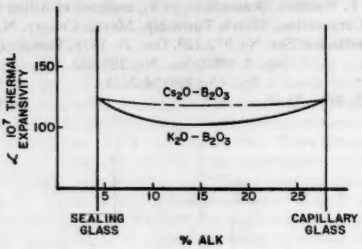
SEALING GLASSES FOR ELECTROCHEMICAL, ELECTRICAL, ELECTRONIC AND OPTICAL APPLICATIONS

Andrew Herczog, Hammondsport, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Oct. 9, 1980, Ser. No. 195,377
Int. Cl.[3] H01M *6/18*
U.S. Cl. 429—193 4 Claims

1. A process for forming a strong, non-porous seal between a sealing glass consisting essentially, expressed in mole percent on the oxide basis, of about 3–30% R_2O, wherein R_2O consists of at least one alkali metal oxide selected from the group of K_2O, Rb_2O, and Cs_2O, and 60–95% B_2O_3, the sum of $R_2O+B_2O_3$ constituting at least 70 mole percent of the total composition, and a base glass having a composition containing at least 10% by weight of an alkali metal oxide consisting of a smaller alkali metal than an alkali metal oxide in said sealing glass, said sealing glass having a softening point below the annealing point of the base glass and a coefficient of thermal expansion closely compatible with that of the base glass, said

process comprising bringing said sealing glass into contact with said base glass at a temperature where the sealing glass will manifest a viscosity between about 10^7–10^{13} poises and



maintaining that contact for a sufficient length of time to cause an exchange of large alkali metal ions from the sealing glass for smaller alkali metal ions in the base glass.

4,311,773

METHOD OF PRODUCING COLOR FILTERS

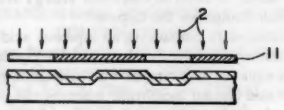
Tadao Kaneko, Tokyo; Michiaki Hashimoto, Yono; Toshio Nakano, and Akira Sasano, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 11, 1980, Ser. No. 120,114

Claims priority, application Japan, Feb. 28, 1979, 54/21855; Feb. 1, 1980, 55/9932

Int. Cl.³ G03C *5/00, 11/00;* G03F *5/00*

U.S. Cl. 430—7 **16 Claims**



1. A method of producing color filters comprising:

a step for forming a photosensitive film by coating, on a substrate, a mixture which contains a water-soluble, negative-working photo-sensitive material and a water-soluble, light-absorbing material which absorbs light, which can be removed with a solvent and which can be dissolved in the photosensitive material;

a step for irradiating light onto the photosensitive film through a predetermined pattern;

a step for removing dissolvable portions of the photosensitive film and the light-absorbing material from the photosensitive film which remains on the substrate; and

a step for dyeing the photosensitive film into any desired color.

4,311,774

IRRADIATION TREATMENT OF POLYMERIC PHOTOGRAPHIC FILM SUPPORTS

Thomas Raphael, Winchester, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 19, 1980, Ser. No. 131,873

Int. Cl.³ G03C *1/78*

U.S. Cl. 430—14 **13 Claims**

1. In a method for preparing a photographic image-bearing element, based on a polymeric support sheet comprising a polyethylene material, the improvement comprising subjecting said support sheet to ionizing irradiation sufficient to penetrate substantially through the support and crosslink the polyethylene material to stabilize said photographic image-bearing element from the distortion effects of high temperatures.

4,311,775

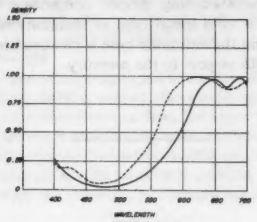
NOVEL PHTHALOCYANINE PIGMENTS AND ELECTROPHOTOGRAPHIC USES THEREOF

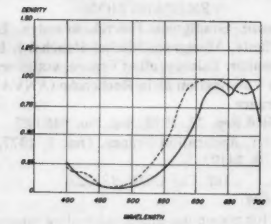
Michael T. Regan, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 6, 1980, Ser. No. 194,200

Int. Cl.³ G03G *5/04, 9/00*

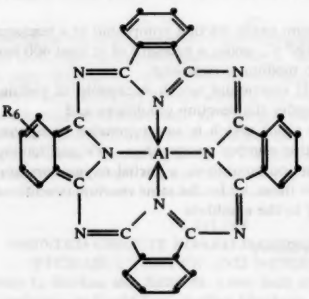
U.S. Cl. 430—37 **22 Claims**





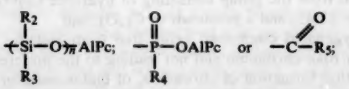
1. An electrically photosensitive material comprising an electrically insulating carrier and an electrically photosensitive phthalocyanine pigment of the structure:

I.



wherein:

R_1 represents



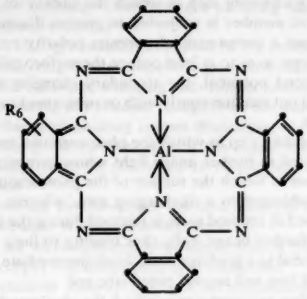
n represents 1, 2, 3 or any combination of 1, 2 and 3

R_2, R_3, R_4 and R_5 represent alkyl, alkylaryl, alkoxy, alkoxyaryl, cycloalkyl, aryl, aralkyl or aryloxy;

R_6 represents hydrogen or chlorine and

AlPc represents

II.



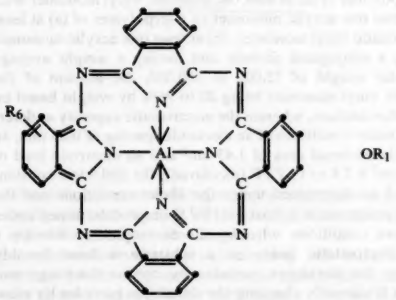
5. A photoelectrophoretic image recording method comprising the steps of:

(a) placing an imaging element comprising a layer of an electrically photosensitive material in an electrical field; and

(b) exposing said element to an image pattern of electromagnetic radiation to which said layer is photosensitive to form a record of the image pattern of electromagnetic radiation in said layer;

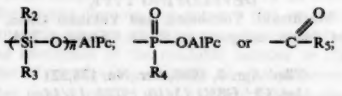
wherein said layer comprises an electrically photosensitive phthalocyanine pigment having the structure:

I.



wherein:

R_1 represents



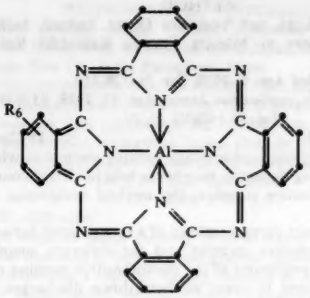
n represents 1, 2, 3 or any combination of 1, 2 and 3

R_2, R_3, R_4 and R_5 represent alkyl, alkylaryl, alkoxy, alkoxyaryl, cycloalkyl, aryl, aralkyl or aryloxy;

R_6 represents hydrogen or chlorine and

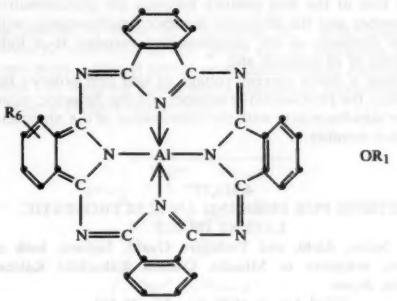
AlPc represents

II.



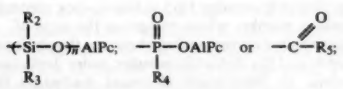
10. An imaging element comprising a layer of an electrically photosensitive material which comprises an electrically photosensitive phthalocyanine pigment of the structure:

I.



wherein:

R_1 represents



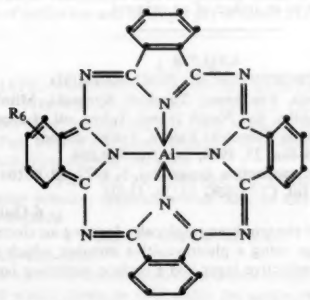
n represents 1, 2, 3 or any combination of 1, 2 and 3

R_2, R_3, R_4 and R_5 represent alkyl, alkylaryl, alkoxy, alkoxyaryl, cycloalkyl, aryl, aralkyl or aryloxy;

R_6 represents hydrogen or chlorine and

AlPc represents

II.



4,311,776

ELECTROPHOTOGRAPHIC IMAGE FORMING METHOD

Kuniki Seino, Aichi, and Yoshihiro Ozaki, Isehara, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 9, 1979, Ser. No. 28,310
Claims priority, application Japan, Apr. 13, 1978, 53/43944
Int. Cl.³ G03G *13/22*
U.S. Cl. 430—48 **11 Claims**

1. An electrophotographic image forming method in which a charge receiving dielectric member is held in virtual contact with a photosensitive member, the method comprising the steps of:

applying a direct current voltage of a first polarity between the photosensitive member and the dielectric member under dark conditions of the photosensitive member of a valve sufficient to cause air breakdown discharges between the members under such dark conditions;

electrically interconnecting the dielectric and photosensitive members and simultaneously illuminating the photosensitive member until the electric field within the photosensitive member becomes substantially zero;

applying a direct current voltage of second polarity opposite to that of the first polarity between the photosensitive member and the dielectric member simultaneously with the exposure of the photosensitive member to a light image of an original; and

applying a direct current voltage of said first polarity between the photosensitive member and the dielectric member simultaneously with the illumination of the photosensitive member.

4,311,777

METHOD FOR FORMING AN ELECTROSTATIC LATENT IMAGE

Kuniki Seino, Aichi, and Yoshihiro Ozaki, Isehara, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 2, 1979, Ser. No. 26,484
Claims priority, application Japan, Apr. 11, 1978, 53-42936
Int. Cl.³ G03G *13/22*
U.S. Cl. 430—48 **13 Claims**

1. A method for forming an electrostatic image on a charge receiving dielectric member held in face-to-face contact with a photosensitive member which comprises the steps of:

applying a direct current voltage between the photosensitive member and the dielectric member under dark conditions to cause air breakdown electrical discharges therebetween;

electrically interconnecting the dielectric and photosensitive members and simultaneously illuminating the photosensitive member until the electric field within the photosensitive member becomes substantially zero; and

applying a direct current voltage of opposite polarity between the photosensitive member and the dielectric member simultaneously with the exposure of the photosensitive member to an image of an original.

4,311,778

ELECTROPHOTOGRAPHIC METHOD

Hidejiro Kadowaki, Yokohama; Yasuhide Kurosaki, Mitaka; Takao Aoki, Abiko, and Naoki Iwami, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1978, Ser. No. 919,508
Claims priority, application Japan, Jul. 5, 1977, 52/80104
Int. Cl.³ G03G *13/22, 13/04*
U.S. Cl. 430—54 **6 Claims**

1. A method of electrophotographically forming an electrostatic latent image using a photosensitive member which includes a photoconductive layer and a surface insulating layer comprising:

(a) a primary charging step in which the surface of the photosensitive member is uniformly charged to a first potential;

(b) an imaging step in which the photosensitive member is exposed to a pattern of image light, subsequent to the primary charging step;

(c) a secondary charging step in which the surface of the photosensitive member is subjected to corona discharge having at least a component of opposite polarity to the primary charge, so as to at least reduce the surface potential to a second potential, the secondary charging step being carried out simultaneously with or subsequent to the imaging step;

(d) a tone regulating step in which the photosensitive member is subjected to further image light whose intensity is controlled and in which the surface of the photosensitive member is subjected to a discharging step, wherein the charge trapped in exposed areas is released during the step of applying further image light, thus tending to limit the surface potential to a predetermined level intermediate the levels of said first and second potentials; and

(e) a whole surface exposure step in which the photoconductive layer is uniformly activated.

4,311,779

DEVELOPER FOR DEVELOPING ELECTROSTATIC LATENT IMAGES

Nobuhiro Miyakawa, Kobe, and Takashi Teshima, Amagasaki, both of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Filed Nov. 28, 1979, Ser. No. 97,981
Claims priority, application Japan, Nov. 28, 1978, 53-145966
Int. Cl.³ G03G *9/00;* C04B *35/64*
U.S. Cl. 430—107 **10 Claims**

1. A carrierless magnetic developer which comprises a binder medium and 45 to 65% by weight, based on the total developer, of fine particles of a magnetic material dispersed in the binder medium, said binder medium consisting essentially of a copolymer of (a) at least one aromatic vinyl monomer with (b) at least one acrylic monomer or a terpolymer of (a) at least one aromatic vinyl monomer, (b) at least one acrylic monomer and (c) a conjugated diolefin and having a weight average molecular weight of 75,000 to 150,000, the amount of the aromatic vinyl monomer being 20 to 95% by weight based on the binder medium, wherein the electrostatic capacity as determined under conditions of an electrode spacing of 0.65 mm, an electrode sectional area of 1.43 cm^2 and an electrode load of 105 g/cm^2 is 7.8 to 11.7 PF (picofarad), the dielectric constant is 4 to 5 as determined under the above conditions and the electric resistance is at least 5×10^{13} Ω-cm as determined under the above conditions; whereby the developer can develop a latent electrostatic image on a substrate without forcibly charging the developer particles by corona discharge and without frictionally charging the developer particles by causing strong sliding contact between the developer and the substrate resulting from rotating the developer in a direction opposite to the moving direction of the substrate.

4,311,780

ELECTROPHOTOGRAPHIC PROCESS AND APPARATUS OF TWO REVOLUTIONS/COPY, WET DEVELOPING TYPE

Manabu Mochizuki, Yokohama, and Yukihiro Ohno, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 8, 1980, Ser. No. 138,321
Int. Cl.³ G03G *15/10, 13/22, 13/24*
U.S. Cl. 430—125 **4 Claims**

1. An electrophotographic process of the two revolutions/copy, wet developing type comprising the steps of, during a first revolution of a rotatable member having a photoconductive layer on its surface,

uniformly charging the rotatable member with a combined charging and image transfer corona discharger,

exposing the member imagewise to form an electrostatic latent image thereon, and

developing the latent image with a combined developing and cleaning roller having a covering layer of a porous elastic material;

and, during a second revolution of the rotatable member,

transferring the developed image onto a transfer sheet using the combined charging and transfer coronoa discharger,

eliminating any residual charge from the member by using a charge eliminating corona discharger,

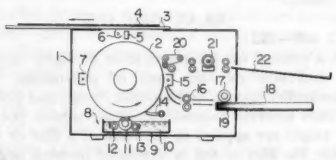
cleaning the member with a developer solution which is supplied by the combined developing and cleaning roller, and

removing any developer solution which is attached to the member with a removing blade.

3. An electrophotographic apparatus of the two revolutions/copy, wet developing type comprises:

a rotatable member having a photoconductive layer on its surface,

a coronoa discharger which serves the combined functions of charging the member and image transfer, an optical system for effecting an imagewise exposure, a charge



eliminating corona discharger, and a combined wet developing and cleaning unit, all disposed adjacent the periphery of the photosensitive member,

the combined developing and cleaning unit including a rotatable roller disposed in abutment against the surface of the photosensitive member and having a covering layer of a porous, elastic material, and a developer solution removing blade disposed to be engageable with and disengageable from the surface of the photosensitive member,

the apparatus operating to effect a uniform charging by the combined function corona discharger and an imagewise exposure by the optical system of the surface of the photosensitive member as well as a developing of an electrostatic latent image formed on the surface by the combined developing and cleaning unit during a first revolution of the rotatable member, the apparatus operating during a second revolution of the rotatable member to effect a transfer of the developed image on the photosensitive member onto a transfer sheet by the combined charging and transfer corona discharger, and elimination of any residual charge from the photosensitive member by the charge eliminating corona discharger as well as cleaning and removal of any attaching developer solution from the member by the combined developing and cleaning unit.

4,311,781

HIGHLY-SENSITIVE HIGH-CONTRAST PHOTOGRAPHIC MATERIALS

Hiroyuki Mifune; Shunji Takada; Yoshitaka Akimura, and Nobuo Sakai, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 949,480, Oct. 10, 1978, Pat. No. 4,241,164, which is a division of Ser. No. 863,000, Dec. 21, 1977, abandoned. This application Jul. 3, 1980, Ser. No. 165,823

Claims priority, application Japan, Dec. 30, 1976, 51-157910

The portion of the term of this patent subsequent to Dec. 23, 1997, has been disclaimed.

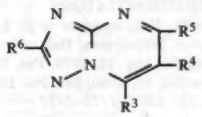
Int. Cl.³ G03C *1/06, 5/30*

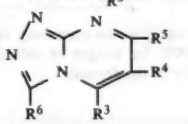
U.S. Cl. 430—264 **10 Claims**

1. A negative image forming process which comprises imagewise exposing to light a photographic light-sensitive material comprising a support having thereon at least one silver halide photographic emulsion layer containing substantially surface latent image type monodispersed silver halide grains and providing a negative image, at least one hydrophilic colloid layer of said photographic material containing a compound represented by the general formula (I)

$$R^1NHNHCOR^2 \quad (I)$$

in an amount of about 10^{-4} to about 10^{-1} mole/mole-Ag, wherein R^1 represents an aryl group and R^2 represents a hydrogen atom, a phenyl group, or an unsubstituted alkyl group having 1 to 3 carbon atoms; and a compound represented by the general formula (II) or (III);


(II)


(III)

wherein R^3, R^4, R^5 and R^6, which may be the same or different, each represents a hydrogen atom, an alkyl group, an aryl group, an amino group, a hydroxyl group, an alkoxy group, an alkylthio group, a carbamoyl group, a halogen atom, a cyano group, a carboxyl group, an alkoxycarbonyl group, or a heterocyclic ring; wherein said R^3 and R^4 or said R^4 and R^5 may combine and form a 5-membered or 6-membered ring and wherein at least one of R^3 and R^5 represents a hydroxyl group and developing said photographic light-sensitive material with a developing solution containing a developing agent selected from the group consisting of a phenylenediamine compound and a combination of a 3-pyrazolidone compound with a hydroquinone compound and, containing about 0.1 mole/liter or more of sulfite ion and having a pH of about 11.0 to about 12.3.

4,311,782

RADIATION-SENSITIVE MIXTURE AND PROCESS FOR THE PRODUCTION OF RELIEF IMAGES

Gerhard Buhr, Königstein, and Hans Ruckert, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 15, 1980, Ser. No. 169,133

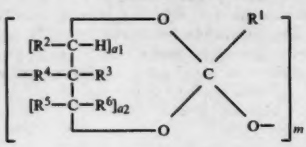
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1979, 2928636

Int. Cl.³ G03C *1/68, 5/00*

U.S. Cl. 430—270 **7 Claims**

1. A radiation-sensitive mixture which comprises (a) a compound which forms an acid under the action of actinic radiation, and (b) a polymeric compound having recurrent ortho-

carboxylic acid ester groupings, which can be split by acid, in the main chain, the solubility of the compound (b) in a liquid developer being increased by the action of acid, and said compound (b) being built up from recurrent units of the general formula I:



(I)

wherein R^1 is a hydrogen atom or an alkyl, cycloalkyl or aryl group, R^2, R^3, and R^5 are identical or different and denote hydrogen atoms or alkyl or aryl groups, R^4 denotes an alkylene group or—if $a_1=a_2=1$—also an alkyleneoxy group, it being possible for the alkylene groups to be interrupted by heteroatoms or by unsaturated or cylic groups, R^6 denotes a hydrogen atom or a methyl group, a_1 and a_2 each denote 0, 1 or 2, a_1+a_2 denotes 1 or 2 and m denotes a number from 3 to 200.

4,311,783

DIMERS DERIVED FROM UNSYMMETRICAL 2,4,5,-TRIPHENYLIMIDAZOLE COMPOUNDS AS PHOTOINITIATORS

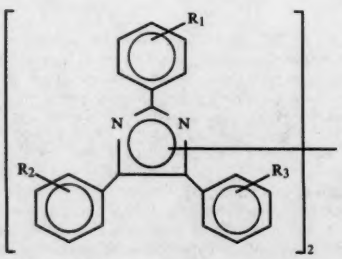
Rolf Dessauer, Greenville, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 66,373, Aug. 14, 1979, Pat. No. 4,252,887. This application Jul. 17, 1980, Ser. No. 169,735

Int. Cl.³ G03C 1/72, 1/52

U.S. Cl. 430—270 **16 Claims**

1. A photoimaging composition consisting essentially of an admixture of 0.1 to 10% by weight of solids of a 2,4,5-triphenylimidazolyl dimer of the formula



wherein

R_1 is 2-bromo, 2-chloro, 2-fluoro, 2-alkyl of 1 to 4 carbon atoms and 2,4-dichloro;

R_2 is 2-bromo, 2-chloro, 2-fluoro, 4-chloro, 2-alkyl of 1 to 4 carbon atoms, 2-cyano, and 2-alkoxy wherein the alkyl radical is of 1 to 4 carbon atoms; and

R_3 is 3,4-dimethoxy, 3,4-diethoxy, 2,3-dimethoxy, 2,4,6-trimethoxy, 4-alkoxy wherein the alkyl radical is of 1 of 4 carbon atoms and 3,4-methylenedioxy; the imidazolyl dimer having an extinction coefficient determined in methylene chloride at 10^{-5} to 10^{-3} mol/liter at 350 nm of at least 4000 liters/mol-cm and at 400 nm of at least 250 liters/mol-cm; and 0.1 to 5.0 percent by weight of solids of leuco dye that is oxidizable to dye by the imidazolyl radicals; and optionally an acid or acid-supplying compound and an energy-transfer dye.

4,311,784

MULTILAYER PHOTOSENSITIVE SOLVENT-PROCESSABLE LITHO ELEMENT

Roxy N. Fan, East Brunswick, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 904,257, May 9, 1978, abandoned. This application Apr. 21, 1980, Ser. No. 142,023

Int. Cl.³ G03C 1/78

U.S. Cl. 430—271 **11 Claims**

1. In a photosensitive dot-etchable litho element having a sheet support and a solvent-processable non-silver halide photosensitive layer, the exposed areas of the solvent-processable photosensitive layer, after imagewise exposure of the element to actinic radiation, being solvent-soluble, the improvement wherein between the support and the photosensitive layer and contiguous thereto is present a non-photosensitive, solvent-soluble dye or pigment-containing layer having an optical density of at least 3.0 in the visible region of the spectrum and a maximum thickness of 0.015 mm, said contiguous layer being adhered to the support.

4,311,785

METHOD FOR THE PREPARATION OF HIGHLY HEAT-RESISTANT RELIEF STRUCTURES AND THE USE THEREOF

Hellmut Ahne, Röttenbach; Eberhard Kühn, Hemhofen; Roland Rubner, Röttenbach, and Erwin Schmidt, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 19, 1980, Ser. No. 179,454

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1979, 2933827

Int. Cl.³ G03C 1/70

U.S. Cl. 430—283 **9 Claims**

1. In a method for the preparation of highly heat-resistant relief structures on the basis of polyimides, polyisoindoloquinazoline diones, polyoxazine diones and polyquinazoline diones wherein radiation-sensitive, soluble polymer precursor stages are applied in the form of a film or a foil to a substrate; the film or foil is irradiated through negative patterns with actinic light or by deflection of a light, electron or ion beam; and the non-irradiated film or foil portions removed, the improvement comprising utilizing as said polymer precursor stage an addition product of an olefinically unsaturated monoepoxide on a product selected from the group consisting of:

(a) a carboxyl-group-containing polyaddition product of an aromatic and/or heterocyclic tetracarboxylic acid dianhydride and a compound selected from the group consisting of a diamino compound and a diamino compound having at least one ortho-position amido group; and

(b) a carboxyl-group-containing polyaddition product of (1) a compound selected from the group consisting of an aromatic and/or heterocyclic dihydroxy dicarboxylic acid and a corresponding diamino dicarboxylic acid, and (2) a diisocyanate.

4,311,786

NOVEL SENSITIZERS AND THEIR USE IN DIRECT-POSITIVE PHOTOGRAPHIC MATERIALS

Rolf Steiger, Praroman, and Jean F. Reber, Marly, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Jul. 11, 1980, Ser. No. 167,551

Claims priority, application Switzerland, Jul. 17, 1979, 6632/79; Oct. 19, 1979, 9418/79

Int. Cl.³ G03C 5/24, 1/36

U.S. Cl. 430—411 **14 Claims**

1. A direct-positive photographic material which has at least one layer which contains a silver halide emulsion, which has been surface-fogged by chemical means or by exposure, and a sensitiser, wherein the sensitiser is a trinuclear tetramethinecyanine dye having three identical heterocyclic ring sys-

tems linked to one another by three identical methine groups in which all or some of the methine hydrogen atoms have been replaced by fluorine, chlorine, bromine or iodine atoms.

4,311,787

PHOTOGRAPHIC SILVER HALIDE MATERIALS CONTAINING DISPERSED LIGHT-ABSORBING MEROSTYRYL DYES

Raymond G. Lemahieu, Mortsel; Felix J. Moelants, Wilrijk, and Frans J. Ville, Edegem, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

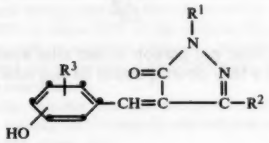
Filed Jun. 11, 1980, Ser. No. 158,450

Claims priority, application United Kingdom, Jun. 29, 1979, 22724/79

Int. Cl.³ G03C 1/84

U.S. Cl. 430—522 7 Claims

1. A light-sensitive photographic silver halide material comprising a hydrophilic colloid layer containing a light-absorbing merostyryl dye, wherein said dye is present in dispersed state and corresponds to the following general formula:



in which:

R^1 represents hydrogen, a C_1–C_4 alkyl group, a substituted C_1–C_4 alkyl group, an aryl group, a substituted aryl group, an aralkyl group or a substituted aralkyl group,

R^2 is one of the groups represented by R^1, a carboxy group, an alkoxycarbonyl group, an aryloxycarbonyl group, a carbamoyl group, an ureido group, or a sulfamoyl group,

at least one of R^1 and R^2 being or containing a carboxy group or a carbamoyl group,

R^3 represents hydrogen, a C_1–C_4 alkyl group, or a C_1–C_4 alkoxy group, and where R^3 is a C_1–C_4 alkoxy group or a C_1–C_4 alkoxy group, it stands in ortho- or para-position in respect of the hydroxy group, which itself is in ortho- or para-position in respect of the methine group,

said merostyryl dye containing no group that renders the dye soluble in the hydrophilic colloid layer.

4,311,788

PROCESS FOR THE QUANTITATIVE DETERMINATION OF A SERUM PROTEIN IN TURBID SERUM AND PLASMA SAMPLES

Claus-Christian Heuck, Hoechst Aktiengesellschaft, D-6230 Frankfur/Main 80, Fed. Rep. of Germany

Filed Jul. 3, 1979, Ser. No. 54,486

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1978, 2829531

Int. Cl.³ G01N 33/54, 33/68, 21/47

U.S. Cl. 435—7 4 Claims

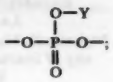
1. A process for the quantitative determination of a serum protein in a turbid serum or plasma sample by nephelometry which comprises the steps of immunologically reacting said serum protein with an antibody therefor and measuring the intensity of scattered light therefrom in the presence of from 10^{-3} to 10^{-1}% by volume of a tenside of the formula

$$CH_3—(CH_2)_m—R—(CH_2—CH_2—O)_n—H$$

in which

R is —O—; —NH—; —CH=CH—$(CH_2)_x$—NH, CH_2CH_2OH or —N—

-continued



Y is H or $(CH_2)_qCH_3$;

m and q, which may be identical or different, stand for integers of from 6 to 26, preferably 6 to 18;

n is an integer of from 7 to 50, preferably 7 to 25;

and

x is 7 or 8.

4,311,789

METHOD FOR SAMPLING AND MEASURING THE CONTENT OF A LOW-MOLECULAR WEIGHT COMPOUND IN A COMPLEX FLUID MEDIUM

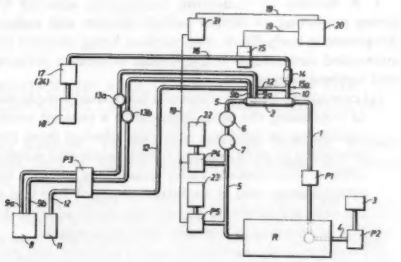
Ulf T. G. Nylen, and Lars A. G. Qvarnstrom, both of Lund, Sweden, assignors to Gambro AG, Sweden

Division of Ser. No. 755,977, Dec. 30, 1976, Pat. No. 4,229,542. This application Aug. 27, 1979, Ser. No. 69,698

Claims priority, application Sweden, Dec. 31, 1975, 7600024

Int. Cl.³ C12Q 1/62, 1/58, 1/54

U.S. Cl. 435—10 22 Claims



1. A method of sampling and measuring the content of a low molecular weight compound in a complex fluid medium to be sampled, comprising the steps of:

providing a complex fluid medium to be sampled;

arranging semi-permeable means in said complex fluid medium to be sampled so as to define one or more passageways in said complex fluid medium for the passage of dialysis fluid therethrough, said semi-permeable means being permeable to the low molecular weight compound in said complex fluid medium whose content is to be measured;

conducting dialysis fluid through said passageways defined by said semi-permeable means in said complex fluid medium, said semi-permeable means being sized so that only a fractional portion of the volume of said complex fluid medium surrounding said semi-permeable means is dialyzed by said dialysis fluid being conducted through said passageways whereby a portion of the low molecular weight compound in said complex fluid medium diffuses into said passageways containing said dialysis fluid to thereby produce a dialysate in said passageways;

maintaining the pressure of said dialysis fluid within said passageways higher than the pressure of said complex fluid medium to substantially reduce ultrafiltration from said complex fluid medium to said dialysis fluid; and

measuring a property of said produced dialysate which is related to the content of the low molecular weight compound in said dialysate to determine the content of the low molecular weight compound in said complex fluid medium.

4,311,790

RADIOENZYMATIC METHOD FOR ASSAYING 3,4-DIHYDROXYPHENYLGLYCOL

Nicholas D. Vlachakis, Altadena, Calif., assignor to The University of Southern California, Los Angeles, Calif.

Filed Jul. 9, 1979, Ser. No. 55,582
Int. Cl.³ G01N *33/48*; C12N *9/10*
U.S. Cl. 435—15 **11 Claims**

1. In a radioenzymatic method for assaying a catechol compound by conversion of the catechol compound to its tritiated O-methylated derivative, extraction with organic solvent and measurement of the radioactivity of extracted material, the improvement, applied to assaying 3, 4-dihydroxyphenylglycol, according to which said catechol compound is 3,4-dihydroxyphenylglycol and said extraction is conducted at a pH of about 1.5 to 5 to obtain tritiated 3-methoxy-4-hydroxyphenylglycol as an extract.

4,311,791

AUTOMATED KINETIC DETERMINATION OF LACTATE DEHYDROGENASE ISOENZYMES IN SERUM

Larry H. Bernstein, 2800 Gaslight La., East, Mobile, Ala. 36609

Continuation of Ser. No. 912,745, Jun. 5, 1978, abandoned. This application Jun. 10, 1980, Ser. No. 158,121
Int. Cl.³ C12Q *1/32*
U.S. Cl. 435—26 **2 Claims**

1. A method of measuring isoenzymes selected from the group consisting of lactate dehydrogenase and malate dehydrogenase in body fluids, said method being adapted for use in automated instruments and operable without a preincubation, said method comprising,

(a) contacting a first portion of a body fluid sample suspected of containing the isoenzymes with a reagent composition containing an oxidized substrate selected from the group consisting of pyruvate and oxaloacetate and nicotinamide-adenine dinucleotide under conditions suitable for enzymatic activity and at a controlled pH of 7 or less wherein the oxidized substrate and nicotinamide-adenine dinucleotide are present in non-rate limiting amounts,

(b) measuring the enzymatic activity of said first portion to obtain a first measurement,

(c) contacting a second portion of said body fluid sample with a reagent composition containing said oxidized substrate and nicotinamide-adenine dinucleotide under conditions suitable for enzymatic activity and at a controlled pH of approximately 7, wherein said oxidized substrate is present in an amount at least 10 times the amount of step (a) and the isoenzyme concentration is approximately the same as step (a),

(d) measuring the enzymatic activity of said second portion to obtain a second measurement,

(e) comparing said first measurement to said second measurement to obtain the difference in activities whereby the amount of isoenzymes is measured as the amount of inhibited isoenzymes activity.

4,311,792

CULTURE COLLECTING AND TRANSPORTING UNIT

Carl F. Avery, Rockford, Ill., assignor to Marion Health and Safety, Inc., Rockford, Ill.

Filed Apr. 14, 1980, Ser. No. 139,771
Int. Cl.³ C12Q *1/24*
U.S. Cl. 435—30 **5 Claims**

1. A culture collecting and transporting unit comprising a tube made of self-sustaining but flexible material, said tube having an open outer end and a closed inner end, a transport media located within said tube, a cap telescoped removably with the open end portion of said tube and adapted to close said tube, and a culture collecting device located within said tube, said unit being characterized in that said culture collecting device comprises an elongated flexible wire, a swabbing tip on the inner end portion of said wire and located adjacent said transport media, and a sleeve telescoped slidably over the outer end portion of said wire and telescoped slidably into said cap, said sleeve being of such length that the inner end portion of said sleeve projects inwardly from the inner end of said cap

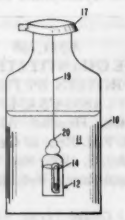
and into the outer end portion of said tube when said cap is telescoped to a fully closed position on said tube.

4,311,793

STERILIZATION INDICATOR

Frank E. Halleck, 820 Elizabeth La., Erie, Pa. 16505

Continuation of Ser. No. 898,306, Apr. 20, 1978, abandoned. This application Jun. 16, 1980, Ser. No. 159,781
Int. Cl.³ C12Q *1/22*
U.S. Cl. 435—31 **17 Claims**



1. A sterilizing indicator comprising, a transparent container,

said container containing a liquid culture medium containing viable spores,

a temperature indicator,

said temperature indicator being substantially surrounded in said liquid culture medium,

said temperature indicator being adapted to change in appearance when it reaches a predetermined temperature to indicate whether the temperature has reached said predetermined temperature for a predetermined time,

said culture media having indicating means to indicate whether viable spores are present therein when said culture media is incubated.

4,311,794

DETERMINATION OF BACTERIAL GROWTH ACTIVITY AND ANTIBIOTIC SENSITIVITY BY CATALASE MEASUREMENT

Joseph L. Melnick, and Craig Wallis, both of Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Continuation of Ser. No. 959,115, Nov. 9, 1978, abandoned, which is a continuation-in-part of Ser. No. 776,323, Mar. 10, 1977, abandoned. This application Jun. 18, 1980, Ser. No. 160,682

Int. Cl.³ C12Q *1/18*

U.S. Cl. 435—32 **36 Claims**

1. A process for measuring bacterial growth activity by catalase reaction, comprising:

contacting in a closed cell a culture medium inoculated with body fluid containing a pathogenic organism with hydrogen peroxide, and a quaternary compound in amounts to provide from about 0.1% to about 2.25% by weight hydrogen peroxide and from about 0.1% to about 9.0% by weight quaternary compound in a catalase reaction product,

the culture medium, hydrogen peroxide and quaternary compound being present in the closed cell in an amount of about 70% to about 90% of the volume thereof,

holding the culture medium, hydrogen peroxide quaternary compound for a period of time sufficient to permit the catalase reaction,

agitating the catalase reaction product in the closed cell thereby forcing O_2 released by the catalase reaction from the aqueous phase, and

then measuring pressure resulting from the released O_2 as an indication of bacterial growth activity.

4,311,795

POLYSACCHARIDE S-53 AND BACTERIAL FERMENTATION PROCESS FOR ITS PREPARATION

Kenneth S. Kang, LaJolla, and George T. Veeder, San Diego, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 16,253, Feb. 28, 1979. This application Nov. 24, 1980, Ser. No. 210,115

Int. Cl.³ C12P *19/04*

U.S. Cl. 435—101 **2 Claims**

1. A process for producing a heteropolysaccharide S-53 comprising incubating in a fermentation medium containing a carbon source, a source of potassium ions, a source of nitrogen, preferably including soy peptone; trace inorganic elements and water, the *Klebsiella pneumoniae* organism, ATCC 31488, at a temperature of 30° C. and pH of 6.5 for 50 hours, and recovering the gum by precipitation with a suitable lower alcohol, such as isopropanol.

4,311,796

METHOD FOR IMPROVING SPECIFIC XANTHAN PRODUCTIVITY DURING CONTINUOUS FERMENTATION

William P. Weisrock, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 14, 1980, Ser. No. 168,884

Int. Cl.³ C12P *19/06*

U.S. Cl. 435—104 **16 Claims**

1. In a continuous process for the production of a heteropolysaccharide by continuously culturing a microorganism of the genus Xanthomonas in a nutrient medium being added to a fermentation zone, withdrawing a heteropolysaccharide-containing effluent from said zone while continuing said process at a rate such that an essentially steady state condition is maintained, the improvement which comprises conducting said process (1) in the presence of sufficient growth limiting nutrient in said medium to produce an average cell concentration of said microorganism of from about 1.5 to less than about 3 gm/liter, and (2) thereafter increasing the growth limiting nutrient in said medium to produce an increased cell concentration of said microorganism of not more than about 5 gm/liter whereby the quantity of said heteropolysaccharide produced per gram of said microorganism at steady state condition is increased.

4,311,797

ANUCLEATED LIVE *E. COLI* VACCINE

George G. Khachatourians, Saskatoon, Canada, assignor to University of Saskatchewan, Saskatoon, Canada

Filed Sep. 18, 1979, Ser. No. 76,610

Int. Cl.³ C12N *15/00*

U.S. Cl. 435—172 **23 Claims**

1. A method of making an *Escherichia coli* (*E. coli*) strain which produces metabolically active, non-reproductive, anucleated live K99+*E. coli* cells comprising the steps of:

mixing an *E. coli* strain which produces, metabolically active, non-reproductive, anucleated live cells (minicells) with a K99+ enteropathogenic *E. coli* strain;

incubating the mixed cells in a culture medium;

separating minicell-producing *E. coli* cells which contain the K99 plasmid from other cells in the culture medium; and

growing the separated minicell-producing K99+*E. coli* in a second culture medium.

4,311,798

METHOD OF AND AN ARRANGEMENT FOR CULTIVATING CELLS OF ANIMAL AND HUMAN TISSUES

Hermann Katinger, Vienna, and Winfried Scheirer, Wiener-Neudorf, both of Austria, assignors to Chemap AG, Maennedorf, Switzerland

Continuation of Ser. No. 840,165, Oct. 6, 1977, Pat. No. 4,173,516, which is a division of Ser. No. 814,415, Jul. 11, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 15,282

Claims priority, application Austria, Jul. 15, 1976, 5213/76

The portion of the term of this patent subsequent to Nov. 6, 1996, has been disclaimed.

Int. Cl.³ C12M *3/02*

U.S. Cl. 435—286 **16 Claims**

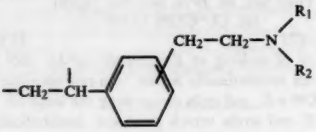
1. An arrangement for cultivating cells of animal and human tissues which are highly susceptible to damage resulting from agitation, comprising an upright container which bounds an unobstructed inner chamber for nutrient solution containing the cells which tend to settle in the solution; guide means located in said inner chamber of said container and subdividing the interior of the latter into two unobstructed zones; means for accommodating an oxygen-containing gas and including an outer gas chamber located below said container; and means for introducing said oxygen-containing gas from said outer gas chamber of said accommodating means into said inner chamber of said container, said introducing means including a plate separating said outer gas chamber from said inner chamber of said container and having a plurality of outlet openings communicating said outer gas chamber with said inner chamber so as to introduce said oxygen-containing gas from the former into the latter, wherein the number and the dimensions of said outlet openings are such that when said oxygen-containing gas is introduced from said outer gas chamber into said inner chamber of said container through said plurality of outlet openings of said plate, it imparts to said nutrient solution in said inner chamber a circulatory movement between said unobstructed zones which is sufficient to prevent the cells from settling and maintain them in suspended state, but is so slight as to avoid agitating said nutrient solution with concomitant damage to the cells, said introducing means constituting the only means for imparting circulatory movement to said nutrient solution and maintaining the cells in suspended state.

4,311,799
NOVEL BASIC CROSS-LINKED POLYMERS

Tetsuya Miyake; Kunihiko Takeda, and Akihiko Ikeda, all of Kawasaki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

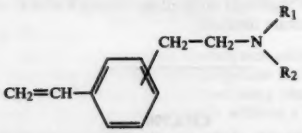
Filed Jul. 2, 1979, Ser. No. 54,055
Int. Cl.[3] C08F *112/08;* B01J *39/20*
U.S. Cl. 521—31 21 Claims

1. A process for producing a copolymer having recurring units of Formula (A)



(A)

which comprises polymerizing a monomer mixture consisting essentially of about 6 to about 98% by weight of a monomer of Formula (C),



(C)

wherein R_1 and R_2 which may be the same or different, each represents a hydrogen atom or a hydrocarbon group selected from the group consisting of C_{1-20} alkyl groups, C_{3-10} cycloalkyl groups, C_{3-8} alkenyl groups, C_{6-15} aryl groups, C_{7-12} arylalkyl groups and C_{1-15} aminoalkyl groups, and about 2 to 94% by weight of divinylbenzene based on the total weight of the monomer of Formula (C) and the divinylbenzene.

4,311,800
PROCESS FOR WORKING UP CROSS-LINKED ISOCYANATE DISTILLATION RESIDUES CONTAINING UREA GROUPS AND USE OF THE PRODUCTS OF THE PROCESS AS STARTING COMPONENTS FOR THE PRODUCTION OF SYNTHETIC RESINS

Artur Reischl, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 16, 1980, Ser. No. 197,447
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1979, 2942678
Int. Cl.[3] C08G *18/14*
U.S. Cl. 521—109 14 Claims

1. A process for the production of isocyanate-reactive compounds, comprising:

(A) reacting

(i) substantially monomer-free, cross-linked distillation residues which are insoluble in inert organic solvents and which cannot melt without decomposition, obtained in the form of slag after denaturation of the sump phase with water when monomeric tolylene diisocyanates are removed by distillation from the crude phosgenation product of tolylene diamines; with

(ii) a dihydric and/or trihydric alcohol at a temperature above 130° C., using a quantity of alcohol corresponding to at least 2% by weight of alcoholic hydroxyl groups, based on the mixture of slag and alcohol,

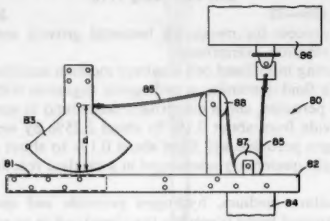
(B) continuing the reaction until the reaction mixture is homogeneous; and

(C) stopping the reaction by cooling.

4,311,801
POLYISOCYANURATE FOAM AND PROCESS THEREFOR

Michael J. Skowronski, Clearwater, and Alberto DeLeon, St. Petersburg, both of Fla., assignors to The Celotex Corporation, Tampa, Fla.

Division of Ser. No. 911,502, Jun. 1, 1978, Pat. No. 4,212,917.
This application Jan. 18, 1980, Ser. No. 113,436
Int. Cl.[3] C08G *18/14, 18/22, 18/76;* B32B *3/26*
U.S. Cl. 521—110 26 Claims

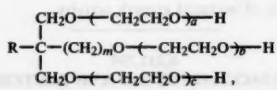


1. A process for producing a polyisocyanurate foam comprising:

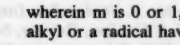
(I) admixing:

(A) a polymethylene polyphenylisocyanate;

(B) a polyol having the formula:



wherein m is 0 or 1, R is hydrogen, hydroxyl, lower alkyl or a radical having the formula:



the sum of a+b+c+d is between 2.0 and 8.0, and the equivalent ratio of A:B is 2:1 to 6:1;

(C) a catalyst;

(D) a blowing agent; and

(E) a surfactant; and

(II) recovering the polyisocyanurate foam.

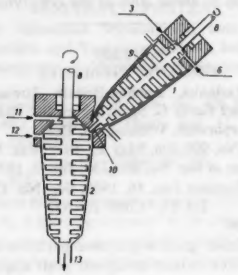
4,311,802
PROCESS AND APPARATUS FOR THE CONTINUOUS PRODUCTION OF FOAMED PLASTICS MATERIAL HAVING IMPROVED FIRE RESISTANCE

Leopold Golser, Leonding, and Helmut Woisetschlager, Linz, both of Austria, assignors to Chemie Linz Aktiengesellschaft, Linz, Austria

Filed Sep. 2, 1980, Ser. No. 183,675
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1979, 2936299
Int. Cl.[3] C08J *9/00*
U.S. Cl. 521—133 4 Claims

1. A process for the continuous production of a flame-resistant foamed plastics material which comprises condensing an aqueous solution of a water-soluble aminoplast precondensate or a precursor thereof with an organic isocyanate which is at least bifunctional in the presence of an acidic curing catalyst to cure the aminoplast precondensate and in the presence of an organic amine as basic catalyst and, optionally, additionally an organic metal compound, the said water-soluble aminoplast precondensate or the precursor thereof being added, simultaneously with but separately from the acid curing catalysts, to the isocyanate to which the amine and, where relevant, the organic metal compound has been added previously, and the isocyanate being present in an amount, relative to the water,

which permits a cross-linking reaction with the methylol groups of the aminoplast precondensate or of the precursor thereof, the said basic catalyst and, where relevant, the organic metal compound, being added in a first mixing stage to the isocyanate in an amount of 4 to 14% by weight, relative to the amount of isocyanate, the residence time of the pre-adduct



formed from the catalyst and the organic isocyanate being from 1 to 8 seconds in the first mixing stage at a reaction temperature within the range of 40° to 130° C., after which the pre-adduct is immediately transferred to a subsequent second mixing stage into which the aminoplast precondensate and acid catalyst are introduced, following which the foamable reaction mixture is discharged continuously.

4,311,803

CONTINUOUS SOLUTION POLYMERIZATION PROCESS

Richard L. Smith; Ralph C. Farrar, and Richard J. Sonnenfeld, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 35,135, May 1, 1979, abandoned. This application Aug. 26, 1980, Ser. No. 181,516

Int. Cl.³ C08F *8/00, 8/42;* **C08C** *19/00*

U.S. Cl. 525—53 **24 Claims**

1. A continuous process for the preparation of a rubbery substantially gel-free and block poly(monovinylarene)-free random copolymer of at least one conjugated diene hydrocarbon with at least one hydrocarbon monovinylarene,

wherein monomers comprising at least one polymerizable conjugated diene and at least one copolymerizable monovinylarene, an organolithium initiator, diluent, gel inhibitor, and at least one randomizing agent in an amount sufficient to substantially randomize the copolymerization of said conjugated diene with said monovinylarene, are fed substantially continuously to a stirred pot reactor zone wherein said monomers are polymerized under solution polymerization conditions of diluent, temperature, and pressure, to a conversion of at least about 90 weight percent,

the resulting polymerization admixture moves substantially continuously into a plug flow zone, and about 3–30 parts per hundred parts monomer of said conjugated diene monomer charge are added to said polymerization admixture upon discharge from said stirred reactor zone to said plug flow zone, wherein in said plug flow zone the polymerization reaction mixture moves substantially continuously and conversion of remaining monomers, if any, essentially completes, and

treating the fully converted polymerization reaction admixture with an effective amount of a coupling agent,

thereby producing said rubbery block poly(-monovinylarene)-free coupled random copolymer continuously.

4,311,804

PROCESS FOR THE PREPARATION OF A FULLY HYDROLYZED POLYVINYL ALCOHOL MODIFIED MELAMINE-FORMALDEHYDE RESIN FOR APPLICATION IN DECORATIVE LAMINATES

Ram S. Raghava, Ann Arbor, Mich., and Calvin Richardson, Cincinnati, Ohio, assignors to Formica Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 46,144, Jun. 6, 1979, abandoned. This application Oct. 30, 1980, Ser. No. 202,110

Int. Cl.³ C08L *61/28*

U.S. Cl. 525—58 **5 Claims**

1. A process for preparation for a hydrolyzed polyvinyl alcohol modified melamine-formaldehyde resin having improved shelf life which comprises:

(a) initiating a reaction between melamine and formaldehyde under alkaline conditions, wherein the mole ratio of melamine to formaldehyde is from about 1:1.5 to about 1:1.8, respectively;

(b) adding, upon the occurrence of a clear melamine-formaldehyde reaction product, a hydrolyzed polyvinyl alcohol having a degree of hydrolysis equal to or greater than about 99.0 percent of the acetate groups in an amount such that the hydrolyzed polyvinyl alcohol constitutes from about 5% to 30%, on a weight basis, of the total weight of the melamine-formaldehyde reaction product solids;

(c) maintaining the reaction at a temperature between 80° C. to 90° C., and

(d) terminating the reaction when the reaction products have a water tolerance, in 5° C. water, between 300% and 1000%.

4,311,805

VINYL ALCOHOL COPOLYMERS CONTAINING CATIONIC GROUPS

Tohei Moritani; Junnosuke Yamauchi, and Makoto Shiraishi, all of Kurashiki, Japan, assignors to Kuraray Company, Limited, Kurashiki, Japan

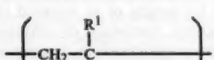
Filed Jul. 14, 1980, Ser. No. 168,712

Claims priority, application Japan, Jul. 12, 1979, 54-89078; Dec. 19, 1979, 54-166238

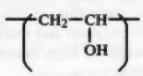
Int. Cl.³ C08F *8/12*

U.S. Cl. 525—60 **38 Claims**

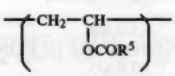
30. A paper strength additive consisting essentially of a water-soluble cationic copolymer which comprises comonomer units respectively represented by the formulae:



(I)

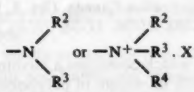


(II)



(III)

wherein R^1 is H or lower alkyl; B is



R^2, R^3, and R^4 are each independently lower alkyl or lower alkyl which contains a substituent; X is an anion capable of forming a salt with the ammonium nitrogen; R^5 is H or lower

alkyl and A is a divalent organic group which links the nitrogen atom in B to the amide nitrogen atom; the proportion of (I) being 0.01 to 20 mole %, the proportion of (II) being 70 to 100 mole % based on the sum of (II) and (III), the proportion of (III) being 0 to 30 mole % based on the sum of (II) and (III); the Brookfield viscosity of a 4% aqueous solution of the copolymer as measured at 20° C. being not lower than 4 centipoises.

4,311,806

POLYBLENDS OF PVC AND STYRENE-MALEIC ANHYDRIDE-RUBBER COPOLYMERS

Daniel L. Dufour, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 17, 1981, Ser. No. 244,576
Int. Cl.³ C08L *51/04, 27/06*
U.S. Cl. 525—71 **7 Claims**

1. A polyblend composition comprising:

A. from 20 to 80% by weight of polyvinylchloride

B. from 80 to 20% by weight of a rubber-modified copolymer of a vinylaromatic monomer, and unsaturaed dicarboxylic acid anhydride and copolymerizable termonomer, wherein the relative weight proportions of the monomers are 50 to 85% of the vinylaromatic monomer, 15 to 30% of the anhydride and 0 to 20% of the termonomer; and wherein the monomers are polymerized in the presence of 5 to 25% by weight of a rubber having a glass transition temperature below 0° C; and

C. from 0 to 40% by weight of a composition comprising a graft copolymer of from 20 to 40% by weight of a monomer selected from the group comprising methyl methacrylate and acrylonitrile and 80 to 60% by weight of a vinyl aromatic monomer said copolymer being grafted onto from 10 to 60%, based on the weight of the composition, of a substrate rubber having a glass transition temperature below 0° C.

4,311,807

POLYBUTYLENE MODIFIED MASTERBATCHES FOR IMPACT RESISTANT POLYPROPYLENE

J. Douglas McCullough, Jr., and Louis C. Rhodes, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 22, 1980, Ser. No. 171,222
Int. Cl.³ C08L *23/16, 23/14, 23/06*
U.S. Cl. 525—197 **8 Claims**

1. A masterbatch composition for the production of impact resistant polypropylene which consists essentially of:

(a) about 20 to 70% by weight of an uncured elastomer selected from the group consisting of ethylene-propylene copolymer, ethylene-propylene-diene terpolymer and mixtures thereof;

(b) about 10 to 40% by weight of an isotactic butene-1 polymer selected from the group consisting of butene-1 homopolymer, butene-1-ethylene copolymer and mixtures thereof; and

(c) about 10 to 40% by weight of high density polyethylene.

4,311,808

CLING FILM COMPOSITION OF OLEFIN POLYMER BLEND

Chung-Sin Su, Verdun, Canada, assignor to Union Carbide Canada Limited, Toronto, Canada

Filed Sep. 23, 1980, Ser. No. 189,877
Claims priority, application Canada, Oct. 5, 1979, 337125
Int. Cl.³ C08L *23/06, 23/08, 23/20, 31/04*
U.S. Cl. 525—222 **8 Claims**

1. A composition which comprises a mixture of:

(a) from 2% to 10% by weight of polyisobutylene having a Staudinger molecular weight of from about 3,000 to about 50,000;

(b) from 3% to 20% by weight of an ethylene-propylene copolymer rubber having a melt index of from about 0.2 to about 2.0 dg/min. and an ethylene/propylene copolymerization ratio of from about 30/70 to about 70/30;

(c) the remainder of said mixture being an olefin polymer selected from the group consisting of polyethylene having a density of from about 0.159 to about 0.930 gm/cc and a melt index of from about 0.3 to about 5.0 dg/min. and an ethylene-vinyl acetate copolymer wherein vinyl acetate comprises up to about 20% of the copolymer.

4,311,809

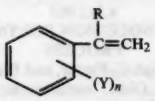
ORGANIC PIGMENTS

William W. Maslanka, London-Britain Township, Chester County, Pa., and Gavin G. Spence, Newark, Del., assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 909,606, May 25, 1978, Pat. No. 4,235,982, and a continuation of Ser. No. 803,330, Jun. 3, 1977, abandoned.
This application Jun. 16, 1980, Ser. No. 159,743
Int. Cl.³ C08F *269/00*
U.S. Cl. 525—286 **8 Claims**

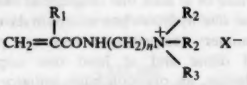
1. Water-insoluble graft copolymer particles consisting essentially of the free radical catalyzed graft copolymerization product of (1) at least one ethylenically unsaturated monomer and (2) a water-soluble cationic prepolymer having an RSV of about 0.1 to about 2.5 (1 M NaCl, 1%, 25° C.), the prepolymer moiety of the graft copolymer particles being present on the surface of the particles,

said monomer (1) being selected from the group consisting of methyl alpha-chloroacrylate, ethyl alpha-chloroacrylate, methyl methacrylate, isopropyl methacrylate, phenyl methacrylate, vinyl chloride, acrylonitrile, methacrylonitrile, and monomers having the formula

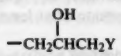


wherein R is hydrogen or methyl, Y is methyl or chlorine, and n is 0, 1, 2, or 3, and said prepolymer (2) being the addition polymerization product of

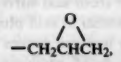
(i) about 5 mole percent to 100 mole percent of a cationic monomer having the formula



wherein n is an integer 1, 2, or 3,
R_1 is hydrogen or methyl,
R_2 is hydrogen or a C_1–C_4 alkyl,
R_3 is hydrogen, a C_1–C_4 alkyl,



where Y is selected from the group consisting of hydroxyl and halogen,



and $-CH_2CH_2O)_nH$ where n is an integer 1 or more and X^- is an anion, and

(ii) from about 95 mole percent to 0 mole percent of at least one monoethylenically unsaturated amide monomer,

the amount of prepolymer (2) employed in preparing the graft

copolymer particles being from about 1 part to about 25 parts by weight for each 100 parts by weight of monomer (1) employed.

4,311,810

BLOCK COPOLYMERS OF PROPYLENE AND 4-METHYL-1-PENTENE

Masaki Fujii; Mitsutaka Miyabayashi, both of Yokkaichi; Hironori Todaka, and Yoshihiro Ishizaki, both of Suzuka, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Japan

Filed Apr. 2, 1980, Ser. No. 136,548

Claims priority, application Japan, Apr. 11, 1979, 54-43809; Jun. 12, 1979, 54-73807

Int. Cl.³ C08F *297/08*

U.S. Cl. 525—321 6 Claims

1. A propylene block copolymer having a propylene content of 30–97 mol %, a limiting viscosity in decalin at 135° C. of 0.3 to 15 dl/g, and consisting essentially of (a) 0.5 to 50 percent by weight of a propylene homopolymer portion and (b) 99.5 to 50 percent by weight of a propylene random copolymer of propylene and 4-methyl-1-pentene, and in which the heat of fusion of the copolymer QIII (cal/g-copolymer) at 170° C. at the highest based on a DSC and the content C of 4-methyl-1-pentene in percent by weight satisfy the following equation:

$$Q_{III} < 0.18\,(100\text{-}C).$$

4,311,811

BORANE REDUCING RESINS

Larry Manziek, Lansdale, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 24,928, Mar. 29, 1979, abandoned, which is a division of Ser. No. 749,560, Dec. 10, 1976, abandoned. This application Nov. 26, 1980, Ser. No. 210,451

Int. Cl.³ C08F *8/42*

U.S. Cl. 525—332 6 Claims

1. A catalyst composition comprising:

(a) a catalytic metal reduced to its zero oxidation state from a solution thereof and precipitated on and/or in (b) a nonionic borane reducing resin substrate having a solid, crosslinked copolymer carbon backbone to which are affixed a plurality of amine- or phosphine-borane adduct groups, (c) which adduct groups are released upon reduction of the metal of the metal-containing solution when contacted with the resin substrate wherein the catalytic metal is selected from platinum, palladium, rhodium or iridium.

4,311,812

BORANE REDUCING RESINS

Larry Manziek, Lansdale, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 24,928, Mar. 29, 1979, abandoned, which is a division of Ser. No. 749,560, Dec. 10, 1976, abandoned. This application Nov. 26, 1980, Ser. No. 210,453

Int. Cl.³ C08F *8/42*

U.S. Cl. 525—337 3 Claims

1. A process for the preparation of hydrogenation catalysts which comprises contacting a platinum, palladium, rhodium or iridium containing aqueous or nonaqueous medium with a nonionic borane reducing resin which comprises a solid, crosslinked copolymer carbon backbone resin having a plurality of amine- or phosphine-borane adducts attached thereto, and separating the resultant metal-containg resin.

4,311,813

N-(α-ALKYLBENZYLTHIO)SUCCINIMIDE

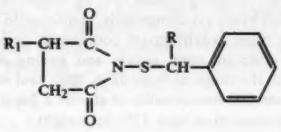
Mark D. Wolfinger, Akron, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 747,710, Dec. 6, 1976, Pat. No. 4,080,342. This application Jan. 6, 1978, Ser. No. 867,228

Int. Cl.³ C08C *19/20, 19/22*

U.S. Cl. 525—348 3 Claims

1. The method of inhibiting premature vulcanization of sulfur vulcanizable diene rubber containing a sulfur vulcanizing agent which comprises incorporating therein, in an amount effective to inhibit premature vulcanization, a compound of the formula



in which R is methyl and R_1 is hydrogen or alkyl of 1–10 carbon atoms.

4,311,814

UNSATURATED POLYESTER RESIN AND PROCESS

Michel Ochsenbein, Creil, and Jean-Paul Ollivier, Paris, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Jul. 24, 1980, Ser. No. 171,610

Claims priority, application France, Sep. 4, 1979, 79 22050

Int. Cl.³ C08G *63/76*

U.S. Cl. 525—438 15 Claims

1. An unsaturated polyester resin containing from about 1.5×10^{-3} to 1.5×10^{-2} ether group per gram of resin and having a viscosity of from about 6 to 20 poise measured at 20° C. on a 60% by weight solution thereof in styrene, comprising the condensation reaction product of at least one dibasic acid or corresponding anhydride, at least one of which is unsaturated, with at least one alcohol, at least one of which is a polyol and at least one of which is a saturated linear ether alcohol containing at least one ether group.

10. The process for the manufacture of an unsaturated polyester comprising condensing at least one dibasic acid or corresponding anhydride, at least one of which is unsaturated, with at least one alcohol, at least one of which is a polyol and at least one of which is a saturated linear ether alcohol containing at least one ether group, said saturated linear ether alcohol being used in an amount sufficient to provide the resin upon completion of condensation with from about 1.5×10^{-3} to 1.5×10^{-2} ether group per gram of resin and a viscosity of from about 6 to 20 poise measured at 20° C. on a 60% by weight solution thereof in styrene.

4,311,815

PROCESS FOR THE PRODUCTION OF MOLDINGS BASED ON POLYURETHANES

Heinrich Heine, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Jun. 27, 1980, Ser. No. 163,678

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1979, 2927597

Int. Cl.³ C08G *18/32, 18/54, 18/08*

U.S. Cl. 525—504 6 Claims

1. A process for the production of polyurethanes which are solid, powderable and fusible and which contain free isocyanate and hydroxyl groups which will not react further below 100° C., comprising reacting organic polyhydroxyl compounds with organic polyisocyanates in quantitative ratios corresponding to an NCO/OH equivalent ratio of from 0.8:1 to

1.2:1, wherein said polyhydroxyl compounds are selected from the group consisting of:

(a) alkoxylation products of ammonia containing 3 hydroxyl groups and having a molecular weight of at least 149 and a hydroxyl group content of at least 12% by weight,

(b) alkoxylation products of aromatic polyamines containing at least 4 hydroxyl groups and having a molecular weight of at least 284 and a hydroxyl group content of at least 12% by weight,

(c) phenol/formaldehyde condensates containing at least 3 phenolic hydroxyl groups and having a phenolic hydroxyl group content of at least 12% by weight,

(d) mixtures of (a), (b), and (c), and

(e) mixtures containing at least 25% by weight of at least one of the polyhydroxyl compounds mentioned in (a), (b), and (c) with other polyhydroxyl compounds optionally containing ether or ester groups and having a molecular weight in the range of from 62 to 3000, said mixture having a mean OH functionality of at least 2.7 and a hydroxyl group content of at least 12% by weight

wherein said reaction is conducted at a temperature from 0° to 100° C.

4,311,816

PROCESS FOR THE PREPARATION OF POLYMERS OF α-OLEFINS

Alistair N. Mollison, and Vaclav G. Zboril, both of Kingston, Canada, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 37,522, May 9, 1979, abandoned, which is a continuation-in-part of Ser. No. 900,298, May 19, 1978, abandoned. This application May 5, 1980, Ser. No. 147,055

Claims priority, application United Kingdom, Apr. 27, 1977, 17601/77

Int. Cl.³ C08F *4/66, 10/02*

U.S. Cl. 526—116 **20 Claims**

1. A solution polymerization process for the preparation of high molecular weight polymers of α-olefins selected from the group consisting of homopolymers of ethylene and copolymers of ethylene and higher α-olefins, said process comprising feeding α-olefin monomer, a coordination catalyst and inert hydrocarbon solvent to a reactor, and separating the polymer thus obtained, said coordination catalyst being an admixture of (A) a solution of an organoaluminum compound and an organo-magnesium compound in inert hydrocarbon solvent, and (B) a solution of a titanium compound and a vanadium compound in inert hydrocarbon solvent, such that in the admixture (a) the atomic ratio of Al:Mg is in the range 0.1–20, (b) the atomic ratio of Ti:V is in the range 0.5–6, (c) the atomic ratio of (Al+Mg):(Ti+V) is in the range 1.1–2.5 and (d) the sum of the expressions Al/(Al+Mg) and Ti/(Ti+V), on an atomic basis, is in the range 0.7–1.4, said organoaluminum compound being selected from the group consisting of alkenyl aluminum, where the alkenyl group has 4–20 carbon atoms, AlR_3 and AlR_2H where each R is alkyl, cycloalkyl or aryl-substituted alkyl of 1–20 carbon atoms, said organomagnesium compound being MgR_2 where each R is as defined, said titanium compound being of the formula $TiX_n(OR')_{4-n}$ where X is chlorine or bromine, R' is alkyl or aryl-substituted alkyl having 1–20 carbon atoms and n is 0–4, and said vanadium compound being selected from the group consisting of $VX_m(OR')_{4-m}$ and $VOX_p(OR')_{3-p}$, where m is 0–4 and p is 0–3.

4,311,817

PROCESS FOR POLYMERIZING OLEFINS AND CATALYST THEREFOR

Yoshinori Morita, and Norio Kashiwa, both of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Continuation of Ser. No. 939,865, Sep. 5, 1978, abandoned. This application Sep. 2, 1980, Ser. No. 183,580

Claims priority, application Japan, Sep. 9, 1977, 52/107704

Int. Cl.³ C08F *4/16*

U.S. Cl. 526—124 **10 Claims**

1. A process for producing spherical polyethylene particles of high bulk density and a narrow particle size distribution comprising polymerizing ethylene in the presence of a catalyst comprising

(A) a halogen-containing titanium compound expressed by the formula

$$Ti(OR)_nX_{4-n}$$

wherein R represents a member selected from the group consisting of alkyl groups with 1 to 10 carbon atoms and aryl groups with 6 to 12 carbon atoms, X represents a halogen atom, and $0 \leqq n < 4$, supported on spray-dried solid spherical carrier particles of magnesium hydroxide or magnesium oxide having a specific surface area of at least 20 m^2/g and an average particle diameter of 5 to 300μ, said component (A) having an atomic ratio of halogen atom/titanium atom of from 5/1 to 50/1, and

(B) 1 to 1000 moles, as aluminum atom, of an organoaluminum compound per mole of the titanium atom in component (A).

4,311,818

BI- AND TRIFUNCTIONAL ORGANOLITHIUM INITIATORS AND APPLICATIONS THEREOF

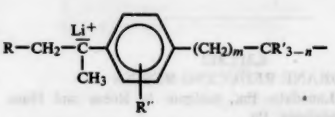
Pierre Sigwalt, Saint Michel sur Orge; Patrick Guyot, Paris, and Michel Fontanille, Montmorency, all of France, assignors to Societe Chimique des Charbonnages-Cdf. Chimie, Paris la Defense and Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, both of, France

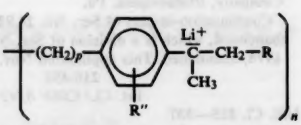
Division of Ser. No. 27,295, Apr. 5, 1979, which is a division of Ser. No. 807,484, Jun. 17, 1977, Pat. No. 4,161,694. This application Jul. 3, 1980, Ser. No. 165,621

Int. Cl.³ C08F *4/48, 279/02*

U.S. Cl. 326—173 **7 Claims**

1. A process for the preparation of polydienes of high stereoregularity which have bifunctional or trifunctional reactive end groups, comprising reacting at a temperature lower than 100° C. (1) a compound having the formula:





in which R'' is either a hydrogen atom or a methyl radical and either n is 1, in which case R'=H and m and p are integers, the sum of which is between 0 and 10 inclusive, or n is 2, R' then being an alkyl radical of 2 to 8 carbon atoms and m=p=0, and in which R is an alkyl radical of 1 to 4 carbon atoms and

(2) a conjugated diene in a non-polar solvent medium.

4,311,819

PREPARATION OF ALKENYL AROMATIC MONOMER BUTADIENE RUBBER

Lu H. Tung; Larry L. Kirkby, and Charles E. Lyons, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 58,704, Jul. 18, 1979, abandoned. This application Nov. 19, 1980, Ser. No. 208,209

Int. Cl.[3] C08F *236/10*

U.S. Cl. 526—173 7 Claims

1. A process for the preparation of an alkenyl aromatic butadiene rubbery polymer, the steps of the method comprising providing a solution comprising 80 to 30 parts by weight of alkenyl aromatic monomer, 20 to 70 parts by weight of butadiene, and up to 50 weight percent based on the total weight of the solution of a solvent which is generally inert under conditions of polymerization, initiating polymerization with a lithium based polymerization initiator at a temperature of from about 10° to about 70° centigrade until about 5 to about 30 weight percent of the combined weight of alkenyl aromatic monomer and butadiene has been converted to form a rubbery alkenyl aromatic monomer-butadiene polymer containing from about 2 to about 25 weight percent styrene, terminating the polymerization and separating unreacted butadiene therefrom.

4,311,820

HOMOPOLYMERS AND COPOLYMERS OF VINYL ETHERS OF POLYALKYLPIPERIDINOLS AND THEIR USE AS STABILIZERS FOR PLASTICS

Erwin Nikles, Liestal, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

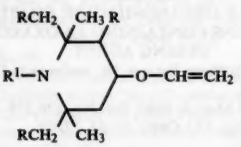
Filed Feb. 4, 1980, Ser. No. 118,356

Claims priority, application Switzerland, Feb. 14, 1979, 1465/79

Int. Cl.[3] C08F *16/14*

U.S. Cl. 526—265 6 Claims

1. A homopolymer of a vinyl ether of the formula I



(I)

in which R is hydrogen or methyl and R^1 is hydrogen, C_1–C_8 alkyl, benzyl, allyl, formyl or acetyl; or a copolymer of said vinyl ether with up to 90 mol % of an ethylenically unsaturated comonomer.

4,311,821

PROCESS FOR THE PREPARATION OF CROSSLINKED ORGANOPOLY-SILOXANES AND THEIR USE AS ACTIVE INGREDIENT OF ABHESIVE COATING MATERIALS FOR TWO-DIMENSIONAL CARRIERS

Christian Weitemeyer, and Götz Koerner, both of Essen, Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

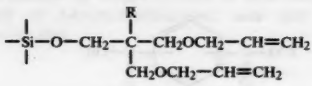
Filed Apr. 22, 1980, Ser. No. 142,838

Claims priority, application Fed. Rep. of Germany, May 5, 1979, 2918254

Int. Cl.[3] C08G *77/06*

U.S. Cl. 528—15 11 Claims

1. In a process for the preparation of crosslinked organopolysiloxanes by the reaction of organosilicon compounds A, having olefinic unsaturated groups with organosilicon compounds B having SiH groups, in the presence of a catalyst, the improvement which comprises organosilicon compounds A having at least one group of the formula



in the average molecule wherein R is methyl, ethyl or $—CH_2OCH_2—CH=CH_2$.

4,311,822

INTERFACIAL PRODUCTION OF POLY(ESTER CARBONATE) OR POLYESTER INCLUDING ACID CHLORIDE SYNTHESIS

Gerald J. Dege, Flanders; Leon Segal, Randolph; Bruce T. DeBona, Madison, and Robert S. Cooke, Morris Plains, all of N.J., assignors to Allied Corporation, Morristown, N.J.

Filed May 2, 1980, Ser. No. 145,901

Int. Cl.[3] C08G *63/62*

U.S. Cl. 528—176 20 Claims

1. A process for the production of a poly(ester carbonate) which comprises:

(a) reacting an alkali metal or alkaline earth metal salt of an aromatic or cycloaliphatic dicarboxylic acid in an inert organic solvent with phosgene in the presence of at least one tertiary nitrogen compound to form a corresponding aromatic or cycloaliphatic dicarboxylic acid chloride dissolved in the organic solvent, carbon dioxide and an alkali metal or alkaline earth metal chloride salt suspended in the organic solution; and

(b) mixing the organic solution with an aqueous solution of an alkali metal or alkaline earth metal salt of a bisphenol under sufficient agitation and with sufficient phosgene and tertiary nitrogen polymerization catalyst present to form a poly(ester carbonate) polymer.

4,311,823

PROCESS FOR PRODUCING AROMATIC POLYESTERS

Shozaburo Imai, Akashi; Haruo Suzuki, Ibaraki; Kuniaki Asai, Tondabayashi, and Katsuji Ueno, Hirakata, all of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

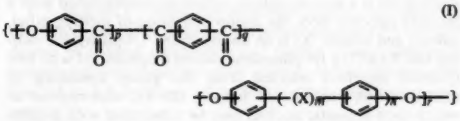
Filed Dec. 31, 1979, Ser. No. 108,951

Claims priority, application Japan, Jan. 10, 1979, 54/2010

Int. Cl.[3] C08G *63/60*

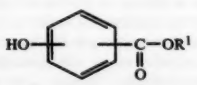
U.S. Cl. 528—181 6 Claims

1. In a process for producing an aromatic polyester represented by the general formula (I):



(I)

wherein X is —O—, $—SO_2—$, —S— or —CO—, m and n are each 0 or 1, and when p=0, q+r=3 to 600, and when q=r=0, p=3 to 600 and when all of p, q and r are not zero, p+q+r=3 to 600) by (1) bulk polycondensation of a compound represented by the general formula (II):

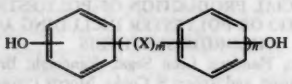


(II)

(wherein R^1 is hydrogen, benzyl, a lower alkyl or phenyl), (2) bulk polycondensation of a compound represented by the general formula (III):

(III)

(wherein R^2 and R^3 are individually hydrogen, benzyl, a lower alkyl or phenyl) with a compound represented by the general formula (IV):



(IV)

(wherein X, m and n are as defined above), or (3) bulk condensation of compounds (I), (II) and (III), the improvement which comprises using three reaction vessels, reacting the compound specified in steps (1), (2) or (3) with an acid anhydride to effect an alkanolylation reaction in the first reaction vessel to thereby prepare a monomer, removing the acids by-produced in said reaction, forming or not forming an oligomer from a part or whole of said monomer, then transferring the reaction product of the first vessel into the second reaction vessel, polycondensing said monomer and/or oligomer to produce prepolymer in the second reaction vessel, transferring the reaction product of the second vessel into the third reaction vessel, and heating said prepolymer in said third reaction vessel thereby obtaining an aromatic polyester having high polymerization degree.

4,311,824

THERMOTROPIC ALKYLAROMATIC COPOLYESTERS

Bernard Fayolle, Ecully, France, assignor to Rhone-Poulenc Industries, France

Filed Sep. 25, 1979, Ser. No. 78,719
Claims priority, application France, Oct. 5, 1978, 78 28947
Int. Cl.³ C08G *63/40*
U.S. Cl. 528—190 **9 Claims**

1. A high molecular weight shapeable thermotropic copolyester having (I) an inherent viscosity of at least 0.5 measured on a solution containing 0.5 g/100 cm^3 in a solvent mixture 50/50 by volume of p-chlorophenol/1,2 -dichloroethane; (II) a flow point which is at least equal to 150° C., and (III) consisting essentially of units of the formulae:

$(-O-X_1-O-)_a$, $(-O-X_2-O-)_b$,
$(-O-X_3-O-)_c$, $-CO-Y-CO-$,
and $-CO-Z-CO-$,

wherein X_1 is a paraphenylene radical monosubstituted with a member selected from the group consisting of methyl, ethyl, chloro, and bromo; X_2 is an unsubstituted 1,4-phenylene radical; and X_3 is (1) a 1,4-phenylene radical disubstituted with two identical members selected from the group consisting of methyl, ethyl, chloro, and bromo; (2) 4,4,'-diphenylene in which each aromatic nucleus may be substituted with a member selected from the group consisting of methyl, ethyl, chloro, and bromo; or (3) a p,p'-diphenylene ether radical in which each aromatic nucleus may be substituted with a member selected from the group consisting of methyl, ethyl, chloro, and bromo, where

$0.4 \leqq a \leqq 1$

$0 \leqq b \leqq 0.6$

$0 \leqq c \leqq 0.1$ and

$a+b+c=1$;

Y is selected from the group consisting of 1,4-phenylene, 1,4-cyclohexylene, a radical containing two 4,4'-diphenylene groups joined to one another by a single bond or an acyclic chain containing up to 8 carbon atoms and zero, 1 or 2 hetero-atoms, and a divalent aromatic radical containing at least two fused phenyl nuclei, in which radical the bonds attached to the carbonyl groups are opposite and parallel; and

Z represents a radical $-(CH_2)_n-$, in which $3 \leqq n \leqq 0$, the molar ratio of $Z/Y+Z$ being between 0.2 and 0.5.

4,311,825

ACETAL POLYMER

Harry Braus, Cincinnati, Ohio, assignor to National Distillers & Chemical Corp., New York, N.Y.

Filed Jul. 21, 1980, Ser. No. 170,340
Int. Cl.³ C08G *4/00*
U.S. Cl. 528—232 **11 Claims**

1. A process for preparing a water-soluble acetal polymer which comprises reacting a hydroxyl-containing aldehyde and a glycol in the presence of an acid to provide the acetal polymer.

4,311,826

MODIFIED SULFUR CEMENT

William C. McBee, and Thomas A. Sullivan, both of Boulder City, Nev., assignors to The United States of America as represented by the United States Department of Commerce, Washington, D.C.

Filed Oct. 16, 1979, Ser. No. 85,450
Int. Cl.³ C08G *75/16*
U.S. Cl. 528—389 **7 Claims**

1. A modified sulfur cement comprising: the polymeric reaction product of elemental sulfur and from 20 to 40 wt. % of a modifier being the combination of dicyclopentadiene and an oligomeric mixture comprising at least trimers of cyclopentadiene, said sulfur cement having a softening point of no more than 116° F.

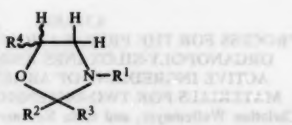
4,311,827

CURABLE ORGANOSILICATE COATING COMPOSITIONS CONTAINING 1,3-OXAZOLIDINE CURING AGENT

Gerry K. Noren, Hoffman Estates, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Mar. 3, 1980, Ser. No. 126,375
Int. Cl.³ C08G *77/32, 77/02*
U.S. Cl. 528—405 **10 Claims**

1. An anhydrous curable organosilicate coating composition comprising an organosilicate having a plurality of atmospheric moisture hydrolyzable alkoxy group-to-silicon bonds and about 1% to about 50% by weight of said organosilicate of a 1,3-oxazolidine curing agent having the formula:



wherein

R^1 is selected from the group consisting of hydrogen, branched, straight chain and cyclic monovalent alkyl, and aryl groups having 1–20 carbon atoms,

R^2 and R^3 are the same or different and are selected from the group consisting of hydrogen, branched, straight chain and cyclic alkyl and aryl groups having 1–10 carbon atoms each, and R^2 and R^3 may be linked together to form a monocyclic or polycyclic ring structure having 3–20 carbon atoms including the 1,3-oxazolidine carbon atom to which R^2 and R^3 are bonded, and

R^4 is hydrogen or an alkyl group having 1–4 carbon atoms;

said composition curing in the presence of atmospheric moisture.

4,311,828

METHOD FOR MODIFYING SURFACE PROPERTIES OF SHAPED ARTICLES OF POLYMERIC MATERIALS WITH LOW TEMPERATURE PLASMA

Kiyoshi Imada, Omiya; Susumu Ueno, Ibaraki; Yasuhide Nishina, Ibaraki, and Hirokazu Nomura, Ibaraki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 16, 1980, Ser. No. 169,396

Claims priority, application Japan, Jul. 16, 1979, 54-90220

Int. Cl.³ C08F *6/00*

U.S. Cl. 528—483 **2 Claims**

1. A method for the modification of the surface properties of a shaped article of a polymeric material which comprises the steps of

(a) subjecting the surface of the shaped article to a first exposure to an atmosphere of low temperature plasma of an oxidizing gas selected from the group consisting of oxygen and gaseous mixtures containing 50% by volume or more of oxygen, and then

(b) subjecting the surface of the shaped article to a second exposure to an atmosphere of low temperature plasma of a non-oxidizing gas selected from the group consisting of helium, neon, argon, nitrogen, nitrous oxide, nitrogen dioxide, carbon monoxide, carbon dioxide, hydrogen, chlorine, hydrogen chloride, sulfur dioxide and hydrogen sulfide wherein said low temperature plasma of a gas is obtained by the electric discharge through an atmosphere of the gas under a pressure of 0.001 to 10 Torr.

4,311,829

APO-β-EMULSANS

David L. Gutnick, Ramat Aviv; Eugene Rosenberg, Raanana; Igal Belsky, Ramat Aviv, and Zosim Zinaida, Kefar Sava, all of Israel, assignors to Petroleum Fermentations N.V., Willemstad, Netherlands Antilles

Division of Ser. No. 12,971, Feb. 22, 1979, abandoned. This application May 14, 1980, Ser. No. 146,052

Int. Cl.³ C08B *37/00*

U.S. Cl. 536—18 **6 Claims**

1. The deproteinized extracellular microbial polysaccharides (herein collectively called "apo-β-emulsans") obtained from the β-emulsans produced by Acinetobacter Sp. ATCC 31012 and its mutants, the apo-β-emulsans being completely N-acylated and partially O-acylated heteropolysaccharides made up of major amounts of D-galactosamine and an aminouronic acid, the apo-β-emulsans containing not more than 5 percent by weight of fatty acid esters in which (1) the fatty acids contain from about 10 to about 18 carbon atoms; and (2) less than 50 percent by weight of such fatty acids are composed of 2-hydroxydodecanoic acid and 3-hydroxydodecanoic acid.

4,311,830

APO-α-EMULSANS

David L. Gutnick, Ramat Aviv; Eugene Rosenberg, Raanana; Igal Belsky, Ramat Aviv, and Zinaida Zosim, Kefar Sava, all of Israel, assignors to Petroleum Fermentations N.V., Willemstad, Curacao, Netherlands Antilles

Division of Ser. No. 12,971, Feb. 22, 1979, abandoned. This application May 14, 1980, Ser. No. 146,051

Int. Cl.³ C08B *37/00*

U.S. Cl. 536—53 **11 Claims**

1. Extracellular microbial lipopolysaccharides (herein collectively called "apo-α-emulsans") comprising the deproteinized lipopolysaccharides obtained from the α-emulsans produced by Acinetobacter Sp. ATCC 31012 and its mutants, the apo-α-emulsans being completely N-acylated and partially O-acylated heteropolysaccharides made up of major amounts of D-galactosamine and an aminouronic acid and containing at least 5 percent by weight of fatty acid esters (1) in which the fatty acids contain from about 10 to about 18 carbon atoms; (2) about 50 percent by weight or more of such fatty acids are composed of 2-hydroxydodecanoic acid and 3-hydroxydodecanoic acid.

4,311,831

APO-ψ-EMULSANS

David L. Gutnick, Ramat Aviv; Eugene Rosenberg, Raanana; Igal Belsky, Ramat Aviv, and Zosim Zinaida, Kefar Sava, all of Israel, assignors to Petroleum Fermentations N.V., Curacao, Netherlands Antilles

Division of Ser. No. 12,971, Feb. 22, 1979, abandoned. This application May 14, 1980, Ser. No. 146,054

Int. Cl.³ C07H *5/06*

U.S. Cl. 536—53 **3 Claims**

1. Apo-ψ-emulsans.

4,311,832

PROEMULSANS

David L. Gutnick, Ramat Aviv; Eugene Rosenberg, Raanana; Igal Belsky, Ramat Aviv, and Zosim Zinaida, Kefar Sava, all of Israel, assignors to Petroleum Fermentations N.V., Willemstad, Curacao, Netherlands Antilles

Division of Ser. No. 12,971, Feb. 22, 1979, abandoned. This application May 14, 1980, Ser. No. 146,055

Int. Cl.³ C08B *37/00*

U.S. Cl. 536—53 **3 Claims**

1. Proemulsans.

4,311,833

PROCESS FOR PREPARING ETHYLCARBOXYMETHYLCELLULOSE

Hajime Namikoshi, and Kazuo Notsu, both of Himeji, Japan, assignors to Daicel Chemical Industries Ltd., Sakai, Japan

Filed Feb. 29, 1980, Ser. No. 126,032

Claims priority, application Japan, Mar. 6, 1979, 54-26268; Mar. 6, 1979, 54-26269

Int. Cl.³ C08B *11/193*

U.S. Cl. 536—90 **5 Claims**

1. A process for preparing ethylcarboxymethylcellulose 0.4 to 1.2 in degree of carboxymethyl substitution and 1.5 to 2.5 in degree of ethoxyl substitution and having good solubility in organic solvents from powdery sodium carboxymethylcellulose 0.4 to 1.2 in degree of carboxymethyl substitution, comprising:

(a) finely dividing the sodium carboxymethylcellulose to an extent that at least 90 wt. % of the resulting particles pass through a 40-mesh screen,

(b) (i) dispersing the finely divided sodium carboxymethyl cellulose in a solvent incapable of mixing with water in a free ratio and subsequently adding to the dispersion a mixture of water and a second solvent miscible with both water and the solvent incapable of mixing with water in a free ratio to adjust the sodium carboxymethylcellulose to water ratio of the dispersion to 75:25 to 50:50 by weight, or (ii) adjusting the water content of the finely divided cellulose to a sodium carboxymethylcellulose to water ratio of 75:25 to 50:50 by weight and dispersing the resulting cellulose in a solvent incapable of mixing with water in a free ratio, and

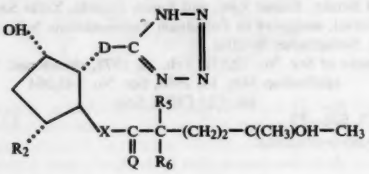
(c) subjecting the dispersion to ethylation.

4,311,834
2-DECARBOXY-2-TETRAZOLYL-19-HYDROXY-19-METHYL-6-OXO-PGF$_1$ COMPOUNDS

John C. Sih, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 54,720, Jul. 5, 1979, Pat. No. 4,225,507.
This application Mar. 3, 1980, Ser. No. 126,492
Int. Cl.[3] C07D 257/04; A61K 31/41
U.S. Cl. 542—429 1 Claim

1. A prostacyclin-type compound of the formula



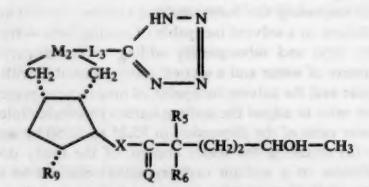
wherein
D is $-(CH_1)_2-CO-CH_2-L_2-$ or $-CH_2-CO-CH_2-L_3-$
wherein L_2 is
(1) $-(CH_2)_j-$, wherein j is one to 4, inclusive,
(2) $-(CH_2)_q-CF_2-$, wherein q is one, 2, or 3, or
(3) $-CH=CH-$,
wherein L_3 is
(1) $-(CH_2)_n-$, wherein n is one to 5, inclusive,
(2) $-(CH_2)_p-CF_2-$, wherein p is 2, 3, or 4, or
(3) $-CH_2-CH=CH-$;
wherein Q is oxo, α—H:β—H, α—OH:β—R_4, or α—R_4:—β—OH,
wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl;
wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro;
wherein X is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —C≡C—, or
(4) $-CH_2CH_2-$.

4,311,835
2-DECARBOXY-2-TETRAZOLYL-19-HYDROXY-6A-CARBA-PGI$_1$ COMPOUNDS

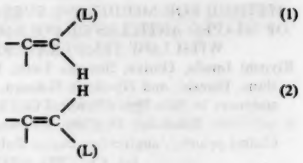
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 54,811, Jul. 5, 1979, Pat. No. 4,225,508.
This application Mar. 3, 1980, Ser. No. 126,486
Int. Cl.[3] C07D 257/04; A61K 31/41
U.S. Cl. 542—429 1 Claim

1. A prostacyclin-type compound of the formula



wherein L_3 is
(1) $-(CH_2)_n-$, wherein n is one to 5, inclusive,
(2) $-(CH_2)_p-CF_2-$, wherein p is 2, 3, or 4,
or
(3) $-CH_2-CH=CH-$;
wherein M_2 is



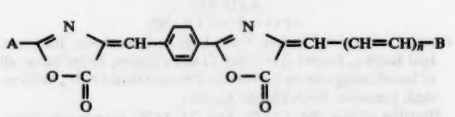
wherein Q is oxo, α-H:β-H, α-OH:β-R_4, or α-R_4:β-OH,
wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro;
wherein R_9 is hydrogen or hydroxyl; and
wherein X is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —C≡C—, or
(4) $-CH_2CH_2-$.

4,311,836
WATER-INSOLUBLE AZLACTONE DYESTUFFS, PROCESSES FOR THEIR PREPARATION AND THEIR USE FOR DYEING OR PRINTING SYNTHETIC FIBER MATERIALS

Rudolf Schickfluss, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 17, 1980, Ser. No. 197,936
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1979, 2942276
Int. Cl.[3] C09B 23/00
U.S. Cl. 542—443 11 Claims

1. A water-insoluble azlactone dyestuff of the formula



in which A is phenyl, or phenyl substituted by halogen or by one or more radicals selected from the group consisting of alkyl radicals of from 1 to 4 carbon atoms and alkoxy radicals of from 1 to 4 carbon atoms, or is naphthyl or a heterocyclic radical; B is phenyl, or phenyl substituted by halogen, by one or more radicals selected from the group consisting of alkyl radicals of from 1 to 4 carbon atoms and alkoxy radicals of from 1 to 4 carbon atoms, or by nitro, cyano, acetamino, carboxylic acid methyl ester, carboxylic acid ethyl ester, acetoxy, dimethylamino, diethylamino or methylenedioxy, or is naphthyl or a heterocyclic radical; and n is the number 0 or 1.

4,311,837

CERTAIN HETEROCYCLIC THIOMETHYL DERIVATIVES OF 7-(DIHALOGENATED PHENYLTHIOACETAMIDO)CEPHALOSPORANIC ACIDS USEFUL IN THE TREATMENT OF INFECTIONS CAUSED BY *STREPTOCOCCUS FAECALIS*

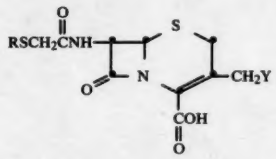
J. Alan Webber, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 35,035, May 1, 1979, Pat. No. 4,261,991. This application Jun. 19, 1980, Ser. No. 161,192

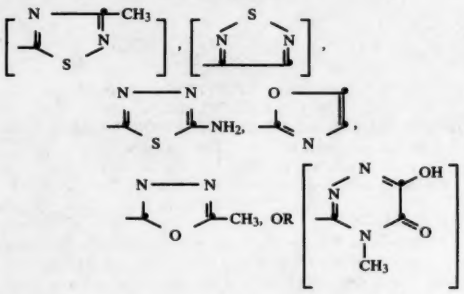
Int. Cl.[3] C07D *501/54*

U.S. Cl. 544—26 5 Claims

1. A compound of the formula



wherein R is 2,5-dichlorophenyl or 3,4-dichlorophenyl, and Y is a heterocyclic thio moiety of the formula —S—X wherein X is a heterocyclic group selected from



or a salt thereof with a non-toxic, pharmaceutically acceptable cation.

4,311,838

TETRAHYDRO-2-NITRIMINO-2H-1,3-THIAZINE

Royston H. Davis, Sittingbourne, and John H. Davies, Canterbury, both of England, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 162,340, Jun. 23, 1980. This application May 11, 1981, Ser. No. 262,014

Claims priority, application United Kingdom, Jul. 30, 1979, 26479/79

Int. Cl.[3] C07D *279/06*

U.S. Cl. 544—54 1 Claim

1. Tetrahydro-2-nitrimino-2H-1,3-thiazine.

4,311,839

BENZISOTHIAZOLE AND NAPHTHO-1,2-THIAZINE COMPOUNDS

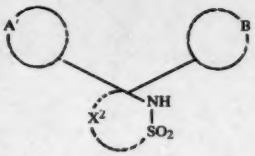
Alan L. Borror, Lexington; Louis Cincotta; James W. Foley, both of Andover, and Marcis M. Kampe, Brookline, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 836,008, Sep. 23, 1977. This application Dec. 22, 1980, Ser. No. 219,214

Int. Cl.[3] C07D *417/12, 275/06*

U.S. Cl. 544—135 39 Claims

1. The compound of the formula



wherein A′ is a 4′-OP-1′-phenyl moiety, unsubstituted or substituted with one or more substituents compatible with organometallic reagents, the same or different, or a 4′-OP-1′-naphthyl moiety, unsubstituted or substituted with one or more substituents compatible with organometallic reagents, the same or different; B is a phenyl moiety, unsubstituted or substituted with one or more substituents compatible with organometallic reagents, the same or different, or a naphthyl moiety, unsubstituted or substituted with one or more substituents compatible with organometallic reagents, the same or different; P is a protecting group; and X^2 *represents the atoms necessary to complete a* 2,3-dihydrobenz-[d]isothiazole-1,1-dioxide moiety or a 2,3-dihydronaphtho-[1,8-de]-1,2-thiazine-1,1-dioxide moiety, said A′ and B moieties being different.

4,311,840

2,3,6,7-TETRAHYDRO-2-THIOXO-4H-OXAZOLO[3,2-a]-1,3,5 TRIAZIN-4-ONES

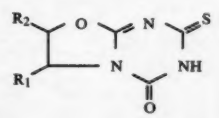
Michael E. Condon, Lawrenceville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 13, 1980, Ser. No. 206,340

Int. Cl.[3] C07D *251/00*

U.S. Cl. 544—223 8 Claims

1. A compound of the formula



wherein

R_1 is phenyl or phenyl substituted with halogen, lower alkyl, phenyl lower alkyl, lower alkoxy, phenyl lower alkoxy, lower alkylthio, phenyl lower alkylthio, or halo lower alkyl when R_2 is hydrogen or lower alkyl; and

R_2 is phenyl or phenyl substituted with halogen, lower alkyl, phenyl lower alkyl, lower alkoxy, phenyl lower alkoxy, lower alkylthio, phenyl lower alkylthio, or halo lower alkyl when R_1 is hydrogen or lower alkyl.

4,311,841

PROCESS OF PREPARING HEXAHYDROPYRIMIDINES

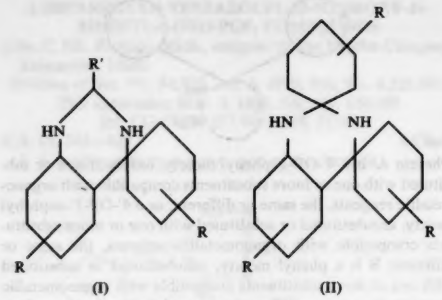
Neil E. S. Thompson, Creve Coeur, and Bernardus A. Oude Alink, St. Louis, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Nov. 21, 1977, Ser. No. 853,612

Int. Cl.[3] C07D *239/72;* C10L *1/22*

U.S. Cl. 544—231 6 Claims

1. A process of preparing the hexahydropyrimidine of formula (I) which comprises reacting a hexahydropyrimidine of the formula (II)



(I) (II)

where R is hydrogen, or alkyl, aryl, aralkyl, alkaryl or cyclohexyl, with an aldehyde of the formula

where R' is a hydrocarbon group or a heterocyclic group.

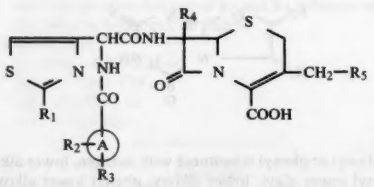
4,311,842

CEPHALOSPORIN COMPOUNDS

Akio Koda; Ichiro Isaka, both of Hoya, and Yukiyasu Murakami, Urawa, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Jul. 2, 1979, Ser. No. 53,852
Claims priority, application Japan, Jul. 20, 1978, 53-88994
Int. Cl.³ C07D *501/56*
U.S. Cl. 544—27 **8 Claims**

1. A cephalosporin compound represented by the general formula



I

wherein R_1 represents a hydrogen atom or an amino group; R_2 and R_3, which may be the same or different, each represents a hydrogen atom, a hydroxy group, an oxo group, a lower alkyl group, or a lower alkoxy group; R_4 represents a hydrogen atom or a lower alkoxy group; R_5 represents —S—R_6 wherein R_6 represents a 5- or 6-membered nitrogen-containing heterocyclic group which is substitutable by a lower alkyl group or lower alkoxy group; and A represents pyridyl group or a thiopyranyl group and a pharmaceutically acceptable nontoxic salt thereof.

4,311,843

DI-N-ALKYL DICARBOXYPYRAZINEDICARBOXYLATES AND FERROUS COMPLEXES

Richard H. Wiley, 8 Roosevelt Circle, Palo Alto, Calif. 94306

Filed Feb. 20, 1981, Ser. No. 236,154
Int. Cl.³ C07D *241/14*
U.S. Cl. 544—225 **6 Claims**

1. A di-n-alkyl dicarboxypyrazinedicarboxylate in which the alkyl groups have six to sixteen carbon atoms.

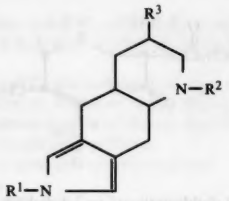
4,311,844

OCTAHYDRO-2H-PYRROLO[3,4,-G]QUINOLINES

Nicholas J. Bach, and Edmund C. Kornfeld, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 141,750, Apr. 18, 1980, which is a division of Ser. No. 31,642, Apr. 19, 1979, Pat. No. 4,235,909, which is a continuation-in-part of Ser. No. 5,062, Jan. 22, 1979, abandoned.
This application Mar. 9, 1981, Ser. No. 241,897
Int. Cl.³ C07D *471/04*
U.S. Cl. 546—84 **1 Claim**

1. A compound of the formula



wherein R^1 is $(C_1$–$C_3)$alkyl-CO, R^2 is H, C_1–C_3 alkyl, allyl or benzyl and R^3 is CH_2X wherein X is OH, Cl, Br, $OSO_2(C_1$–$C_3)$ alkyl, OSO_2tolyl, or OSO_2phenyl, and acid addition salts thereof.

4,311,845

PROCESS FOR THE PREPARATION OF THIENO[3,2-c]PYRIDINE

Emile H. Braye, Auterive, and Jean-Marie Ollivier, Arudy, both of France, assignors to Sanofi, Paris, France

Filed Dec. 22, 1980, Ser. No. 219,247
Claims priority, application France, Dec. 20, 1979, 79 31247
Int. Cl.³ C07D *495/04*
U.S. Cl. 546—114 **17 Claims**

1. A process for the preparation of thieno[3,2-c]pyridine from 4,5,6,7-tetrahydrothieno[3,2-c]pyridine which comprises catalytically dehydrogenating in the gaseous phase at a temperature effective to catalytically dehydrogenate said pyridine in the presence of a catalyst comprising at least one member selected from the group consisting of chromium, nickel, molybdenum, cobalt and tungsten and the oxides thereof.

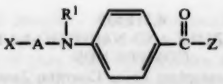
4,311,846

4-[(MONOSUBSTITUTED-ALKYL) AMINO]BENZOIC ACIDS AND ANALOGS AS HYPOLIPIDEMIC AND ANTIATHEROSCLEROTIC AGENTS

Robert G. Shepherd, South Nyack, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 881,456, Feb. 27, 1978, Pat. No. 4,245,097.
This application Aug. 11, 1980, Ser. No. 176,890
Int. Cl.³ C07C *103/78, 103/84;* C07D *211/32*
U.S. Cl. 546—226 **6 Claims**

1. A compound of the formula:



I

wherein

X is selected from the group consisting of chloro, bromo, and iodo;

A is selected from the group consisting of unbranched or branched alkylene groups optionally saturated or (mono- or poly-) unsaturated, represented by the formula

$C_nH_{2(n-p)}$ with n being an integer from 7 to 18, inclusive, and p being an integer from 0 to 5, inclusive;

and Z is selected from the group consisting of (mono- or polyhydroxy)loweralkylamino, allylamino, propargylamino, 2-sulfoethylamino, (mono- or polycarboxy)-loweralkylamino, loweralkanoylamino, loweralkanesulfonylamino, loweralkanoylhydrazino, hydroxylamino, polymethyleneimino, and 4-carboethoxy- or 4-carboxythiazolidino;

wherein R_1 is hydrogen or is a group convertible in vivo thereinto such as, most notably, methyl, ethyl, carboxymethyl, acetyl, trifluoroacetyl, succinyl, 1-(sodium sulfo)-loweralkyl, 1-(sodium sulfo)polyhydroxyalkyl, and 1,3-bis(sodium sulfo)aralkyl;

and the pharmaceutically acceptable non-toxic acid-addition and cationic salts thereof.

4,311,847

XANTHENE COMPOUNDS

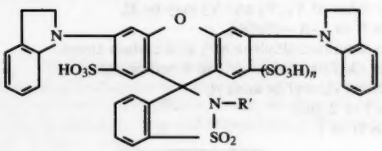
Richard L. Cournoyer, Dorchester, and James W. Foley, Andover, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 106,938, Dec. 26, 1979, Pat. No. 4,258,119. This application Oct. 6, 1980, Ser. No. 194,462

Int. Cl.³ C07D *275/04*

U.S. Cl. 548—207 **3 Claims**

1. A compound of the formula



wherein R′ is alkyl and n is 0 or 1.

4,311,848

Patent Not Issued For This Number

4,311,849

PROCESS FOR MAKING 3-(N-ARYLAMINO)-GAMMA-BUTYROTHIOLACTONES

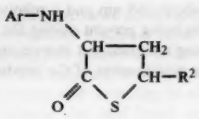
Stephen D. Ziman, San Francisco, Calif., assignor to Chevron Research, San Francisco, Calif.

Filed Sep. 8, 1980, Ser. No. 184,846

Int. Cl.³ C07D *333/24*

U.S. Cl. 549—63 **9 Claims**

1. A process for the preparation of a compound of the Formula (I):



(I)

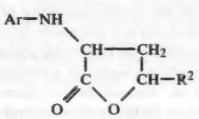
wherein

Ar is phenyl, naphthyl, phenyl or naphthyl substituted with 1 to 4 of the same or different substituents selected from fluoro, chloro, bromo, iodo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or nitro;

R^2 is hydrogen, alkyl of 1 to 6 carbon atoms, phenyl or phenyl substituted with 1 to 2 of the same or different substituents selected from fluoro, chloro, bromo and alkyl of 1 to 6 carbon atoms;

comprising the steps of:

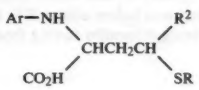
(a) reacting a compound of the Formula (II):



(II)

wherein Ar and R^2 are as defined hereinabove; with an alkyl mercaptan salt having the formula RS^-M^+ wherein R is alkyl of 1 to 10 carbon atoms and M^+ is a monovalent cation;

(b) reacting a compound produced from step (a) of the Formula (III):



(III)

wherein Ar, R and R^2 are as defined hereinabove with a reagnet capable of converting a carboxylic acid to the corresponding acid halide to form a compound of the formula (I).

4,311,850

PREPARATION OF HIGHER MUCONIC ACID MONESTERS

Timothy R. Demmin, Randolph, and Milorad M. Rogic, Whippany, both of N.J., assignors to Allied Corporation, Morristown, N.J.

Division of Ser. No. 1,990, Jan. 8, 1979, Pat. No. 4,208,341. This application Nov. 19, 1979, Ser. No. 95,710

Int. Cl.³ C07C *67/39*

U.S. Cl. 560—131 **2 Claims**

1. A method of producing muconic acid monophenyl ester which comprises reacting a cyclic starting material selected from the group consisting of phenol and catechol with a copper reagent prepared by reacting phenol with a paired spin copper oxide having equimolar amounts of copper and oxygen and showing no absorption by Electron Spin Resonance, said paired spin copper oxide having a relative minimum in the

visible spectrum of about 565 nm and a relative maximum of about 730 nm, oxygen being present during the reaction when phenol is cyclic starting material; and recovering muconic acid monophenyl ester by acidification of the product of the reaction.

4,311,851

PREPARATION OF CARBOXYLIC ACID ESTERS WITH BF_3-ALCOHOL COMPLEX CATALYST

John A. Jung, East Hanover, N.J., and Jimmy Peress, West Haven, Conn., assignors to Chem Systems Inc., New York, N.Y.

Filed Dec. 19, 1979, Ser. No. 105,426
Int. Cl.³ C07C *67/38*
U.S. Cl. 560—233 **6 Claims**

1. In a process for preparing a carboxyalic acid ester wherein an olefin selected from the group consisting of ethylene and propylene is reacted with carbon monoxide in the presence of a catalyst complex containing an equimolar amount of BF_3 and alcohol, with substantially no water, at a temperature of from 0° to 100° C. and at an internal carbon monoxide-to-olefin molar ratio of from 5:1 to 1000:1 to form a product carboxylic acid ester, by-product carboxylic acid esters and BF_3, wherein sufficient BF_3 is stripped from the reaction mass to form a first residue containing substantially equimolar amounts of BF_3, the alcohol, and the product carboxylic acid ester plus by-product carboxylic acid ester, and wherein additional alcohol is added to the first residue to form an admixture which is distilled until a second residue containing said by-product carboxylic acid esters and BF_3-alcohol complex in a molar ratio of 1:2 remains and thereafter combining said second residue with additional BF_3 to form the catalyst complex, the improvement of removing said by-product carboxylic acid esters from said second residue by solvent extraction before adding BF_3 to said second residue, said solvent being a paraffin having from 6 to 20 carbon atoms.

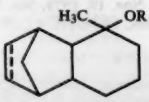
4,311,852

OXYGEN CONTAINING DERIVATIVES OF TRICYCLO[6.2.1.$0^{2,7}$]UNDECANE

Werner Skorianetz, Dardagny, and Günther Ohloff, Bernex, both of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Filed Jul. 2, 1979, Ser. No. 54,028
Claims priority, application Switzerland, Jul. 5, 1978, 7320/78
Int. Cl.³ C07C *69/013, 69/06, 69/07, 69/14, 69/145, 69/54*
U.S. Cl. 560—256 **4 Claims**

1. A compound of formula



possessing a single or double bond in the position indicated by the dotted line and wherein symbol R represents either a hydrogen atom, or a saturated or unsaturated acyl radical containing from 1 to 6 carbon atoms.

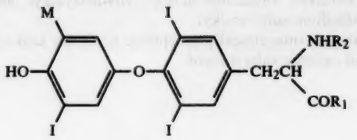
4,311,853

SELENIUM DERIVATIVES OF THYROXINE AND TRI-IODOTHYRONINE

Gavin M. Cree, Amersham, England, assignor to The Radiochemical Centre Limited, England

Filed Jan. 30, 1980, Ser. No. 116,777
Claims priority, application United Kingdom, Feb. 6, 1979, 04037/79
Int. Cl.³ C07C *101/08, 163/00*
U.S. Cl. 562—447 **4 Claims**

1. Selenium derivatives of thyroxine and tri-iodothyronine having the formula:



wherein either

(a)

R_1 is OH
R_2 is —CO—$CX_1X_2X_3$,
at least one of X_1, X_2 and X_3 is $—A_p(SeQ)_q$,
A is saturated alkylene of 1 of 4 carbon atoms,
Q is alkyl or alkenyl of 1 to 6 carbon atoms, cycloalkyl, aryl or aralkyl,
p is 0 or 1,
q is 1 or 2,
one of X_1, X_2 and X_3 may be amino and
any other of X_1, X_2 or X_3 is H, and
M is H or I; or

(b)

R_2 is H,
R_1 is —NZ—$CY_1Y_2Y_3$,
at least one of Y_1, Y_2 and Y_3 is —A—(SeQ)q,
one of Y_1, Y_2 and Y_3 may be $—COR_4$ where R_4 is OH,
any other of Y_1, Y_2 and Y_3 may be H,
Z is H or —A—(SeQ)q,
A is saturated alkylene of 1 to 4 carbon atoms,
Q is alkyl or alkenyl or 1 to 6 carbon atoms,
cycloalkyl, aryl or aralkyl,
q is 1 or 2, and
M is H or I.

4,311,854

PROCESS FOR THE PRODUCTION OF DI-N-PROPYL-ACETIC ACID

Jürgen Weber, Oberhausen; Volker Falk, Voerde, and Claus Kniep, Oberhausen, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Jul. 25, 1979, Ser. No. 60,560
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1978, 2844638
Int. Cl.³ C07C *51/235, 53/128*
U.S. Cl. 562—531 **13 Claims**

1. A process for the preparation of di-n-propylacetic acid comprising the steps of:

A. catalytically reacting n-butyric acid with cleavage of carbon dioxide and water to form heptanone-4 by heating said n-butyric acid at a temperature of 300° to 600° C. in the presence of a catalyst selected from the group consisting of chromium oxide, iron, lanthanum, thorium dioxide and manganese (IV) oxide;

B. hydrogenating heptanone-4 in the presence of a catalyst to form heptanol-4, the hydrogenation being carried out in

the liquid phase at a reaction temperature of 100° to 200° C. employing a hydrogen pressure of 80 to 150 bars;

C. dehydrating heptanol-4 in the presence of an Al_2O_3 catalyst to form heptene-3, the dehydration being carried out in the gaseous phase at a temperature between 200° and 350° C.;

D. hydroformylating heptene-3 in the presence of a rhodium complex compound as catalyst to form a mixture of 2-propyl pentanal and 2-ethyl hexanal;

E. oxidizing the 2-propyl pentanal/2-ethyl hexanal mixture by contacting the same at 20° to 80° C. with oxygen in the presence of an alkali metal salt of a higher monocarboxylic acid as catalyst to form a mixture of di-n-propyl acetic acid and 2-ethyl hexanoic acid and

F. separating the mixture of di-n-propyl acetic acid and 2-ethyl hexanoic acid to recover pure di-n-propyl acetic acid.

4,311,855
FLAMEPROOFING AGENTS

Robert Cole, Dudley, and James E. Stephenson, Birmingham, both of England, assignors to Albright & Wilson Ltd., Oldbury, England

Filed Jan. 25, 1980, Ser. No. 115,194

Claims priority, application United Kingdom, Jan. 26, 1979, 02828/79

Int. Cl.³ C07C *127/00;* **B05D** *3/02;* **C09D** *5/16, 5/18*

U.S. Cl. 564—12 **23 Claims**

1. In a process for the manufacture of a condensation product from a tetrakis(hydroxymethyl)phosphonium salt whose anion is derived from an acid having at least two acid groups and an amide selected from the group consisting of urea and thiourea the improvement which comprises adding a base to an aqueous solution of said tetrakis(hydroxymethyl)phosphonium salt to give an aqueous solution of a tetrakis(hydroxymethyl)-phosphonium salt at pH 4–6.5 and then reacting said solution of phosphonium salt at pH 4–6.5 with said amide in the proportions of 1 mole of tetrakis(hydroxymethyl)phosphonium to 0.05–0.5 moles of amide to form an aqueous medium which is a solution with substantially no insoluble solids at pH 4–6 comprising a tetrakis(hydroxymethyl)phosphonium amide condensation product.

4,311,856
PROCESS FOR SYNTHESIZING UREA

Shigeru Inoue, Kamakura; Hiroshi Ono, Fujisawa; Akito Fukui, Inba, and Haruyuki Morikawa, Chiba, all of Japan, assignors to Toyo Engineering Corp. and Mitsui Toatsu Chemicals, Inc., both of Tokyo, Japan

Filed Dec. 31, 1980, Ser. No. 221,816

Int. Cl.³ C07C *126/02*

U.S. Cl. 564—67 **5 Claims**

1. In a process for synthesizing urea including reacting carbon dioxide and ammonia in a stoichiometrical excess thereto at urea synthesis pressures and temperatures to form a urea synthesis effluent containing unreacted carbon dioxide and ammonia, separating an inert gas from said urea synthesis effluent along with said unreacted carbon dioxide and ammonia entrained in the inert gas under a pressure approximately equal to the urea synthesis pressures, subjecting said urea synthesis effluent to stripping with carbon dioxide or ammonia under a pressure approximately equal to the urea synthesis pressures to separate at least a part of said unreacted carbon dioxide and ammonia, subjecting the urea synthesis effluent resulting from said stripping to high pressure distillation under a pressure of from 10 to 25 kg/cm^2 gauge to separate the major portion of carbon dioxide and ammonia contained therein, subjecting the urea synthesis effluent resulting from said high pressure distillation to low pressure distillation to separate all of the carbon dioxide and ammonia contained therein, to obtain an aqueous urea solution, producing urea from the aqueous urea solution thus obtained, absorbing said carbon dioxide and ammonia separated in said high pressure distillation in an absorbent to form a high pressure absorbate, cooling unabsorbed ammonia gas to separate resulting liquid ammonia from said inert gas, contacting said unreacted carbon dioxide and ammonia separated in said stripping with said high pressure absorbate for condensation, and recycling an ammonium carbamate solution thus obtained and said liquid ammonia to said urea synthesis, the improvement which comprises contacting said inert gas accompanying unreacted carbon dioxide and ammonia with said absorbent along with said carbon dioxide and ammonia separated in said high pressure distillation to obtain said inert gas substantially free of carbon dioxide and containing unabsorbed ammonia, cooling the resulting inert gas to separate said inert gas from the resulting liquid ammonia, and discharging the inert gas thus separated.

4,311,857
1-ARYL-2-ACYLAMIDO-3-FLUORO-1-PROPANOL ACYLATES, METHODS FOR THEIR MANUFACTURE AND INTERMEDIATES USEFUL THEREIN, METHODS FOR THEIR USE AS ANTIBACTERIAL AGENTS AND COMPOSITIONS USEFUL THEREFOR

Tattanahalli L. Nagabhushan, Parsippany, N.J., assignor to Schering Corporation, Kenilworth, N.J.

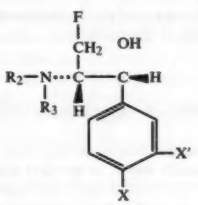
Continuation-in-part of Ser. No. 9,207, Feb. 5, 1979, Pat. No. 4,235,892. This application Apr. 4, 1980, Ser. No. 137,160

Claims priority, application South Africa, Jan. 28, 1980, 80/0478

Int. Cl.³ C07D *209/34;* **C07C** *87/28*

U.S. Cl. 564—212 **7 Claims**

1. A D-(threo-1-aryl-2-amino-3-fluoro-1-propanol of the following formula:



wherein R_2 and R_3 are hydrogen or together with the attached nitrogen form phthalimido or succinimido;

each of X and X' is a member selected from the group consisting of NO_2, SO_2R_1, SOR_1, SR_1, $SONH_2$,. SO_2NH_2, $SONHR_1$, SO_2NHR_1, COR_1, OR_1, R_1, CN, halogen, hydrogen, phenyl, and phenyl substituted by halogen, NO_2, SO_2CH_3, R_1 or OR_1, wherein R_1 is methyl, ethyl n-propyl or isopropyl.

4,311,858
PROCESS FOR PRODUCING N-(HALOMETHYL) ACYL-AMIDES

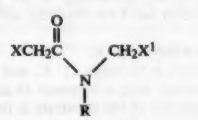
John P. Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 1, 1980, Ser. No. 211,608

Int. Cl.³ C07C *102/00*

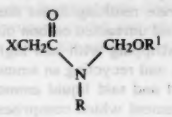
U.S. Cl. 564—214 **25 Claims**

1. Process for preparing compounds of Formula I



I

which comprises reacting a hydrogen halide with a compound of Formula II



where in the above formulae

X is hydrogen, halogen, a C_{1-6} alkyl or haloalkyl radical, a C_{3-7} cycloalkyl radical, a phenyl or benzyl radical or any of said radicals substituted with halogen, NO_2, CF_3, C_{1-6} alkyl or alkoxy, phenyl or benzyl;

X^1 is chloro, bromo or iodo;

R is an acyclic 1-alken-1-yl radical having up to 10 carbon atoms, a C_{5-7} 1-cycloalken-1-yl radical, a phenyl radical or said 1-cycloalken-1-yl or phenyl radicals substituted with one or more C_{1-6} alkyl, alkoxy or alkoxyalkyl, C_{2-4} alkenyl or C_{3-4} alkenyloxy, NO_2 or trifluoromethyl radicals or halogen, and

R^1 is a hydrocarbyl radical having up to 10 carbon atoms or such radical substituted with halogen or C_{1-8} alkoxy or alkoxyalkyl groups.

4,311,859

CATALYTIC HYDROGENATION OF UNSATURATED DINITRILES

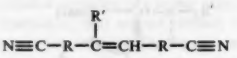
Timothy P. Murtha, Bartlesville, and Charles A. Drake, Nowata, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 5, 1980, Ser. No. 213,444

Int. Cl.³ C07C *85/12*

U.S. Cl. 564—491 **15 Claims**

1. In a process for the catalytic hydrogenation of at least one unsaturated dinitrile of the formula



where each R is independently selected from alkylene radicals and alkylidene radicals and R′ is an alkyl radical, wherein the unsaturated dinitrile is reacted under hydrogenation conditions with hydrogen in the presence of ammonia and a diluent, the improvement which comprises,

reacting the unsaturated dinitrile and hydrogen in the presence of a catalyst consisting essentially of rhodium on a silica support having a surface area larger than 275 m^2/g, a pore volume within the range of about 1.0 to 1.5 mL/g, and an average pore size within the range of about 100 to about 175 Å.

4,311,860

MICROBIOLOGICAL TRANSFORMATIONS OF IONONE COMPOUNDS

Victor Krasnobajew, Küsnacht, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Filed Nov. 20, 1979, Ser. No. 96,111

Claims priority, application Switzerland, Nov. 24, 1978, 12045/78

Int. Cl.³ C12P *7/26, 7/02*; A23L *1/226*

U.S. Cl. 568—378 **2 Claims**

1. A mixture prepared by fermenting β-ionone with a fungus selected from the group consisting of the genera Botryodiplodia, Botryosphaeria and Lasiodiplodia under aerobic conditions wherein

(i) the pH is between 3 and 8;

(ii) the temperature is between 15° C. and 35° C.,

(iii) the fermentation time is between 18 and 216 hours,

(iv) the concentration of the substrate is from 0.5 grams per liter to 20 grams per liter

(v) the fermentation product is separated from the culture by extraction, and the product is characterized by the presence of at least one of the compounds 2-(3-hydroxy-2,6,6-trimethylcyclohex-1-en-1-yl)ethanol or 2-(3-keto-2,6,6-trimethylcyclohex-1-en-1-yl)ethanol.

4,311,861

NORBORNYL ETHERS

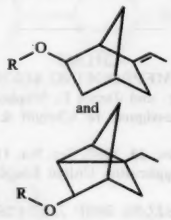
Mark A. Sprecker, Sea Bright, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Filed Oct. 23, 1980, Ser. No. 200,012

Int. Cl.³ C07C *43/18, 43/188*

U.S. Cl. 568—659 **11 Claims**

1. A composition of matter consisting essentially of at least one compound having a structure selected from the group consisting of:



wherein R represents phenethyl; cyclohexyl and allyl; and wherein in each of the structures the moiety "R" is identical.

4,311,862

PREPARATION OF UNSATURATED ETHERS

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 24, 1980, Ser. No. 171,685

Claims priority, application United Kingdom, Sep. 24, 1979, 30595/79

Int. Cl.³ C07C *41/06*

U.S. Cl. 568—689 **14 Claims**

1. A process for the preparation of olefinically unsaturated ethers by reacting a C_4–C_{12} conjugated diene with a C_1–C_8 alkanol by contacting said diene with said alkanol with an acid catalyst selected from the group consisting of sulfuric acid, a sulphonic acid, trifluoroacetic acid and a sulphonic acid ion-exchange resin at a temperature of from about 40° C. to about 150° C. and a pressure of from about 1 to about 200 bars in the presence of a non-basic aprotic solvent selected from the group consisting of a cyclic sulphone, an acyclic sulphone, a sulphoxide, a ketone, a (poly)ether and a nitromethane, wherein the molar ratio of conjugated diene/alkanol ranges from about 1:1 to about 6:1, the amount of solvent/alkanol used ranges from about 1:2 to about 10:1.

4,311,863

PROCESS FOR THE MANUFACTURE OF 1,1,1,2-TETRAFLUOROETHANE

William H. Gumprecht, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Jun. 11, 1980, Ser. No. 158,464

Int. Cl.³ C07C *17/20*

U.S. Cl. 570—170 **8 Claims**

1. A process for the preparation of 1,1,1,2-tetrafluoroethane comprising intimately contacting, at a temperature of about 200° C. to 300° C. under autogenous pressure, a 2-halo-1,1,1-trifluoroethane selected from the group consisting of 2-chloro-1,1,1-trifluoroethane and 2-bromo-1,1,1-trifluoroethane with about one to five molar proportions of an alkali metal fluoride selected from the group consisting of potassium, cesium and rubidium fluoride in 25 to 65 weight % aqueous solution.

4,311,864
METHOD FOR PREPARING SYNTHETIC HYDROCARBON FLUIDS

John P. Pellegrini, Jr., O'Hara Township, Allegheny County; David L. Beach, and Thaddeus P. Kobylinski, both of Gibsonia, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jul. 14, 1980, Ser. No. 168,523
Int. Cl.³ C07C *2/02*
U.S. Cl. 585—530 **16 Claims**

1. A method for preparing a synthetic hydrocarbon functional fluid in a homogeneous reaction system which comprises contacting an olefin reactant selected from 2-butene, an olefin having the formula $CH_2{=}CH{-}R$ wherein R is alkyl having from one to about ten carbon atoms, and mixtures thereof at a temperature between about 2° C. and about 100° C. with a catalytic amount of the reaction product of tungsten hexafluoride and hydrogen fluoride wherein tungsten hexafluoride and hydrogen fluoride in a mol ratio of between about 1:1 and about 20:1 are reacted to form the catalyst, and recovering an oligomer product predominating in synthetic hydrocarbon fractions having between about 20 and about 60 carbon atoms.

4,311,865
MANUFACTURE OF HYDROCARBONS FROM OXYGENATES

Nai-Yuen Chen, Titusville; Joseph N. Miale, Lawrenceville, and William J. Reagan, Englishtown, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 27,186, Apr. 4, 1979, abandoned. This application Feb. 19, 1980, Ser. No. 122,638
Int. Cl.³ C07C *1/00*
U.S. Cl. 585—640 **8 Claims**

1. In a process for manufacturing hydrocarbons from a feed comprising one or more compounds selected from the group consisting of the lower monohydric alcohols with up to four carbon atoms and their simple and mixed ether derivatives, said process comprising passing said feed at a space velocity of about 0.5 to about 100 L.H.S.V. over a catalyst contained in a reaction zone, said catalyst comprising a crystalline aluminosilicate zeolite having a Constraint Index of 1.0 to 12.0 and a silica to alumina ratio of at least about 12, with the temperature in said reaction zone at about 275° C. (507° F.) to about 600° C. (1112° F.), and withdrawing from said reaction zone an effluent comprising steam and hydrocarbons, said process being characterized by a progressive catalyst deactivation due to the high temperature exposure to said steam; the improvement, whereby extending catalyst life, which comprises in combination:

utilizing as catalyst said crystalline aluminosilicate zeolite composited with 0.1 to about 1.0 mol of cobalt oxide per mol of zeolitic alumina; and

reactivating said catalyst after steam deactivation, said reactivation being effected by contact with hydrogen sulfide.

4,311,866
SEPARATION OF PRODUCTS OF HF ALKYLATION

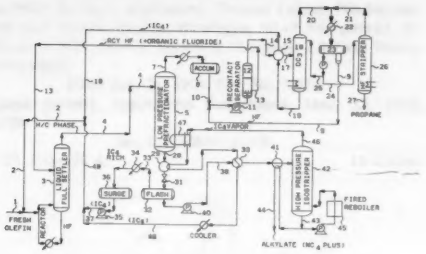
Charles C. Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 7, 1979, Ser. No. 73,468
Int. Cl.³ C07C *2/56, 2/58*
U.S. Cl. 585—719 **8 Claims**

1. A process for treating the reactor effluent hydrocarbon phase from an alkylation zone in which isoparaffin and olefin are contacted in the presence of HF catalyst to form alkylate product, said method comprising:

(a) separating hydrocarbon phase from the reaction effluent;

(b) separating said hydrocarbon phase in a first fractionator to produce an HF-free bottoms stream comprising isoparaffin and alkylate; and



(c) flashing said bottoms stream to produce a flashed vapor enriched in isoparaffin and a flashed liquid enriched in alkylate as compared to said bottoms stream.

4,311,867
PROCESS FOR ISOMERIZING HYDROCARBONS

Makoto Takagawa; Tamotsu Ueno, and Takehiko Takahashi, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Apr. 21, 1980, Ser. No. 142,062
Claims priority, application Japan, Apr. 20, 1979, 54-48607
Int. Cl.³ C07C *5/13*
U.S. Cl. 585—736 **15 Claims**

1. A process for isomerizing hydrocarbons which comprises isomerizing a hydrocarbon mixture containing unbranched or less branched paraffins having 5 to 6 carbon atoms as main components in the presence of hydrogen fluoride and boron trifluoride as a catalyst while keeping percent isomerization of the paraffins having 6 carbon atoms lower than the equilibrium percent isomerization of the paraffins having 6 carbon atoms, on the basis of 2,2-dimethylbutane, at a given isomerization temperature.

4,311,868
PROCESS FOR CONVERTING HYDROCARBON

Tamotsu Ueno; Takehiko Takahashi; Kazuo Takada; Toshio Hidaka, and Makoto Takagawa, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Nov. 20, 1979, Ser. No. 96,157
Claims priority, application Japan, Nov. 21, 1978, 53/143846
Int. Cl.³ C07C *5/13*
U.S. Cl. 585—747 **20 Claims**

1. A process for converting a hydrocarbon by using a fluorine compound represented by the general formula $Z^+MF_6^-$, wherein Z is a hydrogen atom or a hydrocarbon group, and M is a niobium atom, an antimony atom or a tantalum atom, as a catalyst, which comprises separating a reaction product solution resulting from the conversion of the hydrocarbon into a hydrocarbon layer as a first light liquid phase and a catalyst layer as a first heavy liquid phase, said catalyst layer containing catalytically inactive component and catalytically active component, settling catalytically inactive component of the catalyst layer as a second heavy liquid phase, separating the second heavy liquid phase from the catalyst layer to substantially remove the catalytically inactive component, and reusing the remaining catalytically active component in the conversion of hydrocarbon.

4,311,869

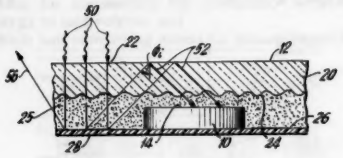
SOLAR CELL MODULES

William T. Kurth, Beverly Farms, and William B. Andrulitis, Manchester, both of Mass., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 920,693, Jun. 3, 1978. This application Nov. 26, 1979, Ser. No. 97,198

Int. Cl.[3] H01L *31/04*

U.S. Cl. 136—246 5 Claims



1. An improved solar cell module comprising:

(a) an internally reflective, transparent cover plate having a pair of opposed surfaces including a substantially smooth planar surface of incidence for accepting incident solar energy, and a uniformly textured surface characterized by a plurality of uniformly configured indentations;

(b) a plurality of silicon solar cells adhesively bonded at the active surfaces thereof to mutually spaced portions of said textured surface and defining therebetween interspaces; and

(c) a light diffusive reflective layer adhesively bonded to the textured surface of the cover plate by a light transparent adhesive in the interspaces defined between said cells for internally reflecting solar energy to strike said surface of incidence of the cover plate at such angles as to be internally re-reflected, whereby the energy is caused to progress toward the active surfaces of the solar cells.

4,311,870

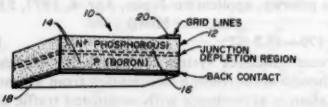
EFFICIENCY OF SILICON SOLAR CELLS CONTAINING CHROMIUM

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Amal M. Salama, New Port Beach, Calif.

Filed Sep. 11, 1980, Ser. No. 185,867

Int. Cl.[3] H01L *31/06, 31/18*

U.S. Cl. 136—261 14 Claims



1. A photovoltaic solar cell device comprising

a silicon wafer doped with an element providing a first conductivity type and containing 10^{13} to 10^{16} atoms/cm^3 of chromium in the form of precipitates having a diameter less than 1 Angstrom and containing a surface layer of opposed conductivity type; and

contact means connected to each of said conductivity portions of the wafer.

4,311,871

STRAND-SEPARATION ARRANGEMENT AND A METHOD FOR SEPARATING THE STRANDS OF A MULTI-CONDUCTOR ELECTRICAL CABLE

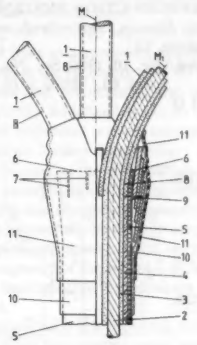
Hans-Peter Brunner, Greifensee; Thomas Caldor, Niederrohrdorf, and Helmut Orgler, Wettingen, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jan. 31, 1979, Ser. No. 7,975

Claims priority, application Switzerland, Mar. 23, 1978, 3207/78

Int. Cl.[3] H02G *15/00*

U.S. Cl. 174—74 A 11 Claims



1. A multi-conductor power cable having a separation of the conductors, comprising:

a plurality of strands of the power cable, each strand including:

an electrical conductor; and

insulation means for electrically insulating said electrical conductor;

a sheath surrounding the plurality of strands;

means for permitting the sheath to expand circularly at an end of the sheath;

means for mechanically strengthening the insulation means of each of the electrical conductors; and

means for mechanically strengthening the sheath in the vicinity of the end of the sheath.

4,311,872

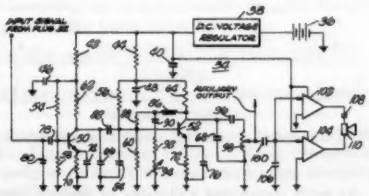
PORTABLE VOICE COMMUNICATION SYSTEM

Robert P. Davis, 3250 Waverly Dr., Los Angeles, Calif. 90027

Filed May 21, 1979, Ser. No. 40,804

Int. Cl.[3] H04R *1/44*

U.S. Cl. 179—1 R 12 Claims



1. An improved portable voice communication system comprising:

a throat microphone assembly attachable on the neck of a user near the voice box to generate electrical signals in the audio frequency range in response to the user's voice;

a speaker unit for reproducing voice sounds corresponding

to an amplified form of the electrical signals generated by the throat microphone; and,

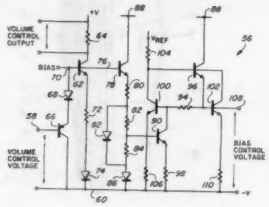
an amplifier unit for amplifying the electrical signals generated by the throat microphone to drive said speaker unit and containing a frequency variable phase shift network for adjusting the phase between lower frequency audio components being amplified to alleviate severe phase shift distortions in the amplified audio signals for driving the speaker to reproduce the voice sounds of the user.

4,311,873

BIAS CONTROL CIRCUIT AND METHOD FOR USE IN AUDIO REPRODUCTION SYSTEM OR THE LIKE

Michael J. Gay, Geneva, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 10, 1980, Ser. No. 128,999
Int. Cl.³ H03G *5/16*
U.S. Cl. 179—1 D **15 Claims**



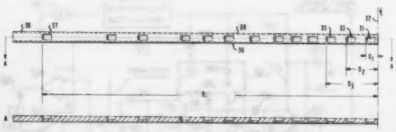
1. In a system having combined volume and tone control stages, the stages including bias current splitter transistor pairs, the improvement comprising a bias control circuit responsive to an applied control signal for providing a first control output signal at a first output which is proportional to said applied control signal and providing a second control output signal at a second output which monotonically increases from a first level to a second predetermined level as the applied control signal varies from a minimum to a maximum input level such that the bias current levels in the tone control stages are varied accordingly with said second control output signal to improve the signal to noise ratio of the system.

4,311,874

TELECONFERENCE MICROPHONE ARRAYS

Robert L. Wallace, Jr., Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 17, 1979, Ser. No. 104,375
Int. Cl.³ H04M *1/20*; H04R *3/02*
U.S. Cl. 179—1 CN **19 Claims**



8. An array comprising a plurality of acoustic transducers arranged colinearly

CHARACTERIZED IN THAT

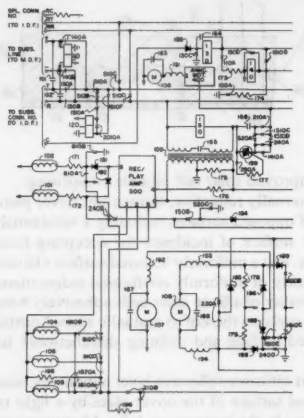
the spacings between said acoustic transducers and the center of said array are monuniform, such that said array produces a response pattern with one main lobe of a given amplitude and a plurality of sidelobes having a preselected envelope with lesser amplitudes.

4,311,875

INTERFACE SYSTEM ISOLATING A SUBSCRIBER SUBSET FROM A TELEPHONE SWITCHING SYSTEM

Dean W. Danner, Waukesha, Wis., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.

Continuation-in-part of Ser. No. 589,151, Jun. 20, 1975, abandoned, which is a continuation-in-part of Ser. No. 872,850, Jan. 27, 1978, abandoned. This application Sep. 17, 1979, Ser. No. 76,012
Int. Cl.³ H04M *3/42, 11/04*
U.S. Cl. 179—2 A **9 Claims**



1. An interface system, connected to a telephone switching system and to a subscriber subset equipped with calling signal generating means, said interface system including: switching system isolation means; battery feed means connectible to said subset; calling signal detection means including signal decoding means connected to said subset, initially operated in response to a calling signal generated at said subset, and program seize means connected to said decoding means, operated in response to said decoding means, to operate said switching system isolation means to DC isolate said switching system from said subset and connect said battery feed means to said subset; and said battery feed means operated in response to connection to said subset to maintain said program seize means operated after termination of said calling signal.

4,311,876

ROUTE GUIDANCE SYSTEM FOR ROADWAY VEHICLES

Hiroshi Endo, Yokosuka; Kousaku Baba, Yokohama, and Akira Matsumura, Yokosuka, all of Japan, assignors to Nissan Motor Company, Ltd., Yokahama, Japan

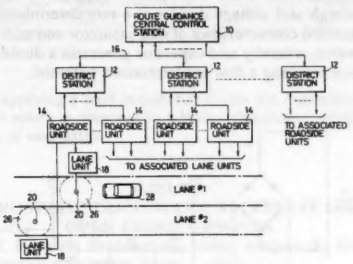
Filed Apr. 3, 1978, Ser. No. 893,601
Claims priority, application Japan, Apr. 6, 1977, 52-38577
Int. Cl.³ H04B *1/66*
U.S. Cl. 179—15.5 ST **19 Claims**

1. A route guidance system for roadway vehicles for conveying thereto aural routing information from a central monitoring station in accordance with monitored traffic data, comprising:

remotely located stations each being connected over a communication channel to said central station and adapted to receive inquiry signals transmitted from a vehicle in a specified area of a roadway and in response to transmit routing information to the same vehicle within the specified area, each of said stations comprising multiple location, addressable storage means for storing at respective different storage locations a plurality of different pieces of routing information received from said central station,

means for receiving modulated electromagnetic energy including a destination code signal transmitted from said vehicle, means for demodulating said received electromagnetic energy, means at the remote station and responsive to said destination code for addressing said storage means to select a particular piece of routing information from said storage means, time-compression means for compressing the time dimension of said selected routing information, means for modulating electromagnetic energy with the time-compressed routing information, and means for transmitting the modulated electromagnetic energy to said vehicle; and

a vehicle unit comprising means for generating said destination code signal in response to said vehicle entering said specified area, means for modulating electromagnetic energy with said destination code signal, means for transmitting the modulated electromagnetic energy to said remote station for addressing a particular piece of routing information stored at a particular storage location in said remote station, means for receiving the electromagnetic energy transmitted from the remote station, means for demodulated the received electromagnetic energy, time-expansion means responsive to said demodulating means for expanding the time dimension of said demodulated energy to recover said selected piece of routing information, and means for electroacoustically transducing said audio routing information in audible form in said vehicle.



4,311,877

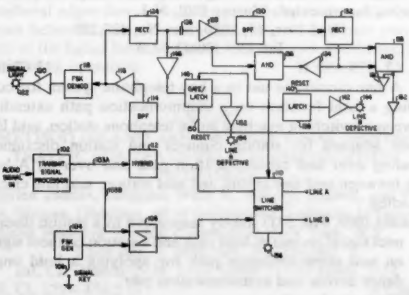
METHOD AND MEANS FOR IMPROVING THE RELIABILITY OF SYSTEMS THAT TRANSMIT RELATIVELY WIDEBAND SIGNALS OVER TWO OR MORE RELATIVELY NARROWBAND TRANSMISSION CIRCUITS

Leonard R. Kahn, 137 E. 36th St., New York, N.Y. 10016

Continuation-in-part of Ser. No. 105,248, Dec. 19, 1979, abandoned. This application Jan. 28, 1980, Ser. No. 116,231

Int. Cl.³ H04B *1/66*

U.S. Cl. 179—15.55 R **18 Claims**



1. Communications equipment for transmitting from a transmitting site and receiving at a receiving site relatively wideband audio waves, using two or more relatively narrowband communications lines, said narrowband communications lines typically having, for example, a frequency response of 300 to 3,000 Hz and said lines being subject to failure and attendant interruption of service, comprising;

means, to be located at the transmitting site, for converting the relatively wideband audio waves into two or more frequency segments one of which segments includes most of the high intelligibility components of any voice waves present, the majority of said high intelligibility components typically falling above 50 Hz and below 2,500 Hz,

means for coupling the two or more segments to the two or more relatively narrowband lines,

means for coupling the received segments at the far end of said narrowband lines to a receiving device,

means, to be located at the receiving site, for processing the received segments and recombining the segments to reconstruct a relatively wideband wave to better approximate the original wideband waves, said transmitting and receiving equipment further comprising;

(a) means, to be located at the transmitting site, for generating a first control signal appreciably narrower in bandwidth than said frequency segments,

(b) means, to be located at the transmitting site, for combining the signal generated by said (a) means with the narrowband segment of the signal which includes most of the high intelligibility components of any voice waves present,

(c) means, to be located at the receiving site, for detecting the presence of the first control signal generated by said (a) means,

(d) means, to be located at the receiving site, controlled by said (c) means, for generating a second control signal having a characteristic which is a function of the output of the (c) detecting means,

(e) means for coupling said second control signal to a relatively narrowband line, other than the line to which the segment including most of the high intelligibility components is coupled at the transmitter site end of the line, so as to transmit said second control signal to the transmitting site,

(f) means, to be located at the transmitting site, for sensing said characteristic of the second control signal,

(g) means, to be located at the transmitting site, for switching the segment, which includes the high intelligibility signal components, from the communications line it is coupled to one of the two or more lines used for transmitting components other than the high intelligibility components said transmitting switching means controlled by said (f) means so as to be activated when said (c) means does not sense the presence of signal, and,

(h) means, to be located at the receiving site, for switching lines so as to conform with the line connections at the transmitting site at approximately the same time as said (g) switching means are activated.

4,311,878

DIALING INTERVAL TRANSMISSION GATING ARRANGEMENT

Paul R. Berkowitz, Red Bank; Thomas M. Quinn, Little Silver; David C. Trimble, Holmdel, and Tse L. Wang, Matawan, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 2, 1979, Ser. No. 53,780

Int. Cl.³ H04M *1/40*

U.S. Cl. 179—16 EC **9 Claims**

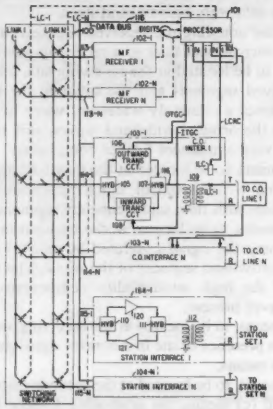
1. In a communication system having a plurality of stations, said stations having MF digital signaling capability, a plurality of Central Office (CO) communication lines, a network communications link for interconnecting selected ones of said stations and said CO lines,

means in said communication system common to a group of said stations for receiving MF digit signals from said stations,

common control means for concurrently connecting said MF signals receiving means, a calling station and a CO line to said network communication link,

said common control means cooperatively associated with said MF receiving means and including means for providing dial pulse signals representative of each MF digit signal received from a connected calling station to said CO line,

means including a first transmission gate controlled by said common control means and responsive to the initiation of



said MF digit signaling from said station for inhibiting communication transmission to said CO line from said connected station for the duration of said MF dialing interval, while still providing said dial pulse signals to said CO line,

means including a second transmission gate controlled by said common control means and operative during the transmission of said dial pulses to said CO line for inhibiting transmission from said CO line during said dial pulse transmission interval, and

for allowing transmission from said CO line to said connected station when a break in MF dialing is detected so as to allow the passage from said CO line to said station of any signals on said CO line.

4,311,879

AC SUPERVISORY SIGNAL DETECTOR CIRCUIT

Douglas J. Brush, Lombard, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Jun. 2, 1980, Ser. No. 155,700

Int. Cl.³ H04M *7/00*

U.S. Cl. 179—18 AH **5 Claims**

1. An alterating current supervisory signal detector circuit for use in a first telephone switching system, connected to a second telephone switching system, said second telephone switching system operated to generate an alternating current supervisory signal, said alternating current supervisory signal detector comprising:

bridge rectifying means connected to said second telephone switching system, operated in response to said alternating current supervisory signal to convert said alternating current supervisory signal to a direct current supervisory signal;

threshold conducting means connected to said bridge rectifying means;

gating means connected to said threshold conducting means;

said threshold conducting means operated in response to a predetermined amplitude of said direct current supervisory signal to conduct said direct current supervisory signal to said gating means;

said gating means operated in response to said conducted direct current supervisory signal to generate a supervision detected signal;

a diode connected to said gating means;

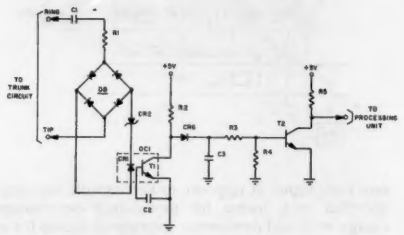
a capacitor connected to said diode;

a voltage divider connected to said capacitor;

a resistor connected to said diode; and

a power supply connected to said resistor;

said diode operated in response to said supervision detected signal to electrically disconnect said capacitor from said power supply, said capacitor operated in response to said disconnection from said power supply, to discharge through said voltage divider at a rate determined by the electrical characteristics of said capacitor and said voltage divider, whereby said capacitor generates a disable signal upon reaching a first predetermined potential;



said diode further operated in response to termination of said supervision detected signal to electrically connect said capacitor to said power supply via said resistor, said capacitor operated to charge to a second predetermined potential in response to current flow from said power supply through said resistor and said capacitor, at a rate determined by the electrical characteristics of said capacitor and said resistor, whereby said capacitor generates an enable signal upon reaching said second predetermined potential;

buffer means connected to said voltage divider, operated in response to said disable signal, to generate a delayed supervision detected signal; and

said buffer means further operated in response to said enable signal to terminate generation of said delayed supervision detected signal.

4,311,880

KEY TELEPHONE HOLD ARRANGEMENT

Gerry C. Balzer, Freehold; Alan M. Gordon, Matawan, both of N.J.; Michael W. Leibowitz, Charleston, S.C., and Karl R. Wittig, New York, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 10, 1980, Ser. No. 205,259

Int. Cl.³ H04Q *5/18*

U.S. Cl. 179—99 H **13 Claims**

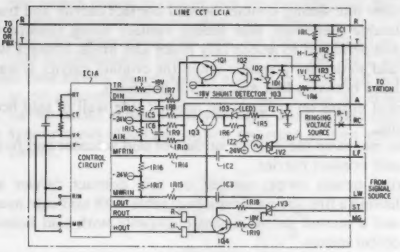
1. A line circuit for use in a key telephone system for controlling a hold function on a communication path extending between a switching machine and a telephone station, said line circuit adapted for station connect and station disconnect signaling over said communication path and over an A-lead path between said line circuit and said station, said line circuit including

means **(509, 510, 511)** jointly responsive to a station disconnect signal on said A-lead path and a station connect signal on said communication path for applying a hold impedance across said communication pair

characterized in that

means **(502, 504, 508, 509, 510, 511)** effective during a fixed

time interval following a station connect answer occurring during a ringing signal from the switching machine



for applying a hold impedance across the communication path solely in response to a station disconnect signal over one of said paths.

4,311,881

ELECTROSTATIC TRANSDUCER BACKPLATE HAVING OPEN ENDED GROOVES

John M. Reynard, Framingham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 5, 1979, Ser. No. 54,983

Int. Cl.³ H04R *19/00*

U.S. Cl. 179—111 R **3 Claims**

1. An electrostatic transducer comprising a relatively inflexible support plate for a flexible diaphragm, said support plate having at least one major irregular surface of conductive material formed in a die forming operation employing a liquid lubricant, said major surface being defined by a series of projections spaced apart by intervening grooves, said grooves and said projections extending fully across said major surface to the peripheral edges thereof so as to provide open channels thereacross between each of said projections to eliminate entrapment of the liquid lubricant in each of said grooves during said die forming operation.

4,311,882

METHOD OF AND ARRANGEMENT FOR TESTING TRAFFIC ROUTES IN TELECOMMUNICATION NETWORKS

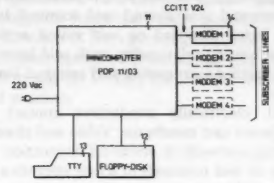
Wilfried Johner, Langnau; Willy R. Haerry, Thalwil, and Paul A. Heman, Obfelden, all of Switzerland, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 7, 1980, Ser. No. 110,565

Int. Cl.³ H04M *1/24, 3/30;* **G06F** *11/00;* **H04J** *3/14*

U.S. Cl. 179—175.2 D **5 Claims**

1. Method of traffic route testing in a telecommunication network with the aid of a central processing unit and a plurality of remote processing units wherein test calls are set up between calling stations and automatic answering stations, wherein the central processing unit transmits to each of the remote processing units the data needed for performing a sequence of test calls, and wherein the remote processing unit stores said data and based thereon independently sets up the



test calls, detects the test results and stores them, and further wherein the central processing unit requests the test results from each of the remote processing units whereby a data connection between the central processing unit and the respective remote processing unit is set up for the duration of the data transmission.

4,311,883

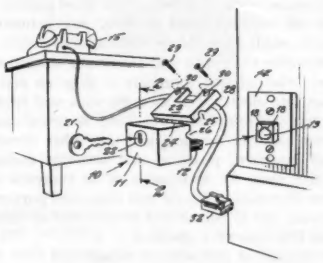
MODULAR TELEPHONE JACK LOCK

Susan L. Kidney, 95 S. Grove St., Apt. 2-E, Valley Stream, N.Y. 11580

Filed Mar. 10, 1980, Ser. No. 128,396

Int. Cl.³ E05B *73/00;* **H01R** *13/60;* **H04M** *1/66*

U.S. Cl. 179—189 R **6 Claims**



1. A modular telephone jack lock, comprising in combination, a case, said case including a clamp for locking an extension cord of a desk-set therein when said plug is engaged in a socket opening; a plug protruding from a rear of said case for snap-fitting into the socket opening of a modular telephone system; and a lock mechanism inside said case for unlocking said plug from said socket opening.

4,311,884

MINIATURE SEALED DUAL-IN-LINE SWITCH

Roger Henley, Upton, and Blake W. Reynolds, Marblehead, both of Mass., assignors to C & K Components, Inc., Newton, Mass.

Filed May 21, 1979, Ser. No. 41,070

Int. Cl.³ H01H *19/00, 21/00, 23/00*

U.S. Cl. 200—5 R **38 Claims**

30. An electrical switch comprising:

a base at least partially formed of dielectric material, said base being formed with a plurality of spaced, insulated, raised surfaces defining at least one cavity between adja-

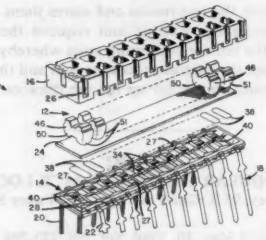
cent ones of said raised surfaces, said raised surfaces having shoulders formed thereon;

a plurality of spaced electrical terminals mounted to said base, each of said terminals having a land within said cavity and an end projecting outwardly from one side of said base;

an electrically insulative deformable membrane disposed in sealing engagement with said peripheral shoulders to form an environmental seal around said terminal lands, said membrane being disposed on said raised surfaces in a spaced, confronting relationship with said terminal lands to form a chamber surrounding said terminal lands within said cavity;

an elongated, electrically conductive contact disposed closely adjacent said membrane within said chamber, said contact being normally in electrical connection with said land of one of said terminals in a first operative position;

means for normally maintaining said contact in confronting, spaced relationship with respect to said land of others of said terminals;



a bezel secured to said base and having a surface disposed in a spaced, confronting relationship with said membrane;

actuator means captured between said bezel surface and said membrane outside of said chamber, said actuator means being pivotable upon the application of eccentric force in one direction to depress said membrane toward said land of one other of said terminals to urge an end of said contact into electrical connection with said land of said other terminal to produce a bridging electrical connection between said one terminal and said other terminal in a second operative position, said actuator means being pivotable upon the application of an eccentric force in another direction to release said depressed portion of said membrane and to permit said contact end to return to its normal first operative position;

a detent formed on said actuator means; and

a projection formed on said bezel, said detent and said bezel projection acting cooperatively to retain said actuator means in a desired one of said first and said second operative positions.

4,311,885

SNAP ACTION SLIDE SWITCH

Ronald H. Arthur, Lauderhill, Fla., assignor to AMF Incorporated, White Plains, N.Y.

Filed Aug. 27, 1980, Ser. No. 181,555

Int. Cl.³ H01H *15/02*

U.S. Cl. 200—16 C **17 Claims**

1. A snap action slide switch comprising

a hollow box-like housing having an open bottom and a substantially closed top,

an elongated aperture in said top,

a switch actuator within said housing proximate said top and accessible through said aperture for sliding said actuator back and forth within said housing,

a plurality of spaced stationary contacts mounted within said housing,

a translatable contact carrier within said housing between said actuator and the bottom of the housing,

means for slidingly supporting said contact carrier within said housing,

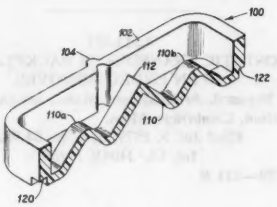
at least one sliding contact on said contact carrier and translatable therewith, said sliding contact being constructed and arranged to selectively make and break contact with said stationary contacts when the contact carrier is translated between first and second positions,

detent means on at least one interior side wall of said housing,

cam means on the interior surface of said actuator and facing said contact carrier,

spring detent means carried on said contact carrier and having a first spring means engagable with said cam means and a second detent means engagable with said housing detent means,

means associated with said second detent means for storing energy during a detenting operation of said second detent means with said housing detent means,



means permitting a predetermined limited translation of said actuator relative to said contact carrier before the actuator engages the contact carrier to cause both to move together,

said first spring means being flexed by said cam means as the actuator and contact carrier move relative each other from a first relative position, thereby storing energy in the spring means,

said housing detent means and said second detent means moving relative to each other as the contact carrier moves with said actuator, thereby storing energy in said energy storage means associated with the second detent means during a predetermined limit of travel of the two detenting means relative to each other, said last named energy storage means releasing energy when said predetermined limit of travel is passed,

the first spring means being constructed and arranged to store sufficient energy to move the contact carrier independently of the motion of the actuator when the second detent means reaches a given location relative to the housing detent means.

4,311,886

TIMING APPARATUS FOR LAMPS AND APPLIANCES

Roger D. Rulseh, New Holstein, Wis., assignor to AMF Incorporated, White Plains, N.Y.

Filed Apr. 18, 1980, Ser. No. 141,444

Int. Cl.³ H01H *7/00*

U.S. Cl. 200—38 R **15 Claims**

4. Timing apparatus for controlling the energization of an electrical plug receptacle into which the cord of a lamp or appliance, or the like, may be plugged, comprising

a case having front and back walls,

an electrical plug receptacle within the case and adapted to receive the prongs of an electrical plug of a lamp, appliance, or the like,

electrical switch means within said case having at least one movable contact blade that may be selectively moved to open and close contacts of the switch means,

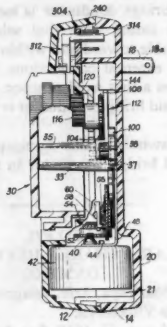
means extending through said case for connecting said switch means to a source of electrical power,

electrical conductor means connecting said switch means to said plug receptacle for energizing the receptacle when the switch means is closed and for deenergizing the plug receptacle when the switch means is open,

a time dial mounted on said case for rotation about an axis that is substantially normal to said front and back walls,

said case having an outwardly extending back wall portion at or adjacent one end thereof that forms an enlarged cavity between said front and back walls of said case,

a synchronous electrical motor mounted in said enlarged cavity,



means for connecting said motor to said source of electrical power for energizing said motor,

gear train means coupling said motor to said time dial for rotating the time dial as a function of the motor rotation,

a plurality of time setting means selectively positionable on said dial at locations corresponding to desired times of day,

switch actuation means responsive to selectively positioned time setting means when desired time of day locations on the time dial move to an actuating position,

said switch actuation means controlling said movable contact blade in a predetermined manner in response to said time setting means on the time dial.

4,311,887

HANDLE OPERATING MECHANISM FOR USE WITH AN ELECTRIC CIRCUIT BREAKER

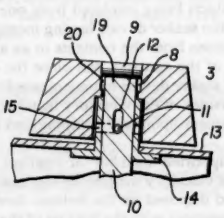
Masatomo Takagi, Hachioji; Takanori Hagawa, Oume; Seietsu Takamatsu, Hamura, and Isao Ookoshi, Tama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Nov. 21, 1979, Ser. No. 96,306

Claims priority, application Japan, Dec. 28, 1978, 53-161126

Int. Cl.³ H01H *27/00*

U.S. Cl. 200—42 T **4 Claims**



1. A rotary handle operating mechanism for use with an electric circuit breaker comprising:

a manually operable handle member;

an operating axle having an elongated hole formed therein interconnecting the handle member and the electric circuit breaker;

means for engaging the operating axle with the handle member, said engaging means being disposed within the elongated hole of the operating axle;

means for guiding the movement of the handle member, said handle member including a hole formed therein, said hole being positioned between the handle member and the operating axle when the handle member is moved in the axial direction of the operating axle; and

locking means operatively associated with the hole in the handle means for locking the handle means at a predetermined position.

4,311,888

POSITION SENSOR

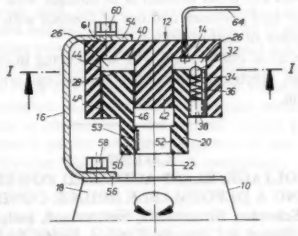
Hans-Georg Waschulewski, Danziger Strasse 17, 4020 Mettmann, Fed. Rep. of Germany

Filed Feb. 12, 1979, Ser. No. 11,330

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1978, 2806002

Int. Cl.³ H01H *1/06*

U.S. Cl. 200—52 R **7 Claims**



7. A position sensor comprising:

a first part including first and second conductors insulated from each other, said conductors defining an annular planar sliding surface interrupted by a radially extending slot between the conductors, said first and second conductors including first and second edges, respectively, on opposite sides of said slot;

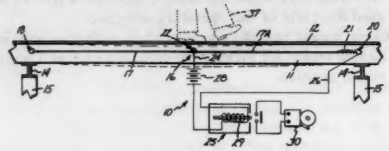
a second part, rotatable relative to said first part and having a bore disposed therein substantially normal to said sliding surface of said first part, and including a conducting ball closely received in said bore and resiliently engaging said sliding surface, said conducting ball having a diameter greater than a width of said slot and said conducting ball being guided by said second part during relative rotational movement of said first and second parts on a circular path intersecting said radially extending slot so that said conducting ball is resiliently urged into said slot; and

wherein said first and second conductors and said conducting ball are so arranged and constructed that when said conducting ball is simultaneously engaged with both said first and second conductors the only parts of said first and second conductors engaged by said conducting ball are said first and second edges each of which are engaged by said conducting ball only at a point.

4,311,889
ALARM DEVICE

Jeffrey R. Blanchard, 1267 Clarence St., St. Paul, Minn. 55106, and Lawrence J. Themmes, 2656 E. 16th Ave., North, St. Paul, Minn. 55109

Filed Jan. 28, 1980, Ser. No. 116,096
Int. Cl.[3] H01H *35/00*
U.S. Cl. 200—52 R 19 Claims

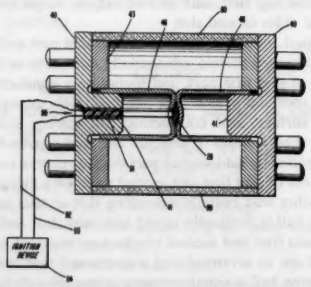


1. An alarm device installable with respect to a locally deflectable building structure member, comprising:
- an electrical contact fixed for deflection with the deflectable member and movable upon deflection of the deflectable member between a first position and a second position deflected from the first position;
- a taut wire having a portion located proximate the electrical contact;
- first anchoring means fixed to the deflectable member anchoring one end of the wire to the deflectable member, and second anchoring means fixed to the deflectable member anchoring an opposite end of the wire to the deflectable member, said wire portion being located between the first and second anchoring means;
- said electrical contact and wire being relatively located such that the electrical contact is in contact with said wire in one of said positions and out of contact with said wire in the other of said positions;
- said electrical contact and wire when being in contact forming an electrical circuit for association with an alarm system.

4,311,890
HIGH-VOLTAGE, BLAST-ACTUATED POWER SWITCH HAVING A DEFORMABLE BRIDGE CONDUCTOR

Gunther Schroder, Birmenstorf, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jan. 15, 1980, Ser. No. 112,315
Claims priority, application Switzerland, Feb. 15, 1979, 1497/79
Int. Cl.[3] H01H *39/00*
U.S. Cl. 200—61.08 15 Claims

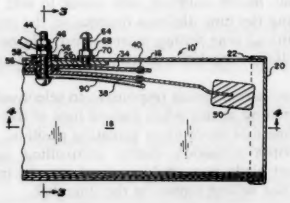


10. A high-voltage, blast-actuated power switch having a hollow switch casing and having first and second external electrical connections, said first and second external connections being electrically insulated from each other, said switch comprising:
- a bridge conductor included within said switch casing, said bridge conductor electrically connecting said first external connection to said second external connection; and
- blasting means included within said switch casing for blasting said bridge conductor so as to electrically disconnect said first external connection from said second external connection;
- wherein said bridge conductor includes a deformable region, said region forming a torus-shaped, radially bent edge on said bridge conductor when said bridge conductor is blasted by said basting means;
- wherein said bridge conductor is movably mounted within said switch casing such that said bridge conductor is axially movable toward and within at least one of said first and second external connections, said bridge conductor moving from a first axial position to a second axial position when said bridge conductor is blasted by said blasting means; and
- wherein said switch further comprises holding means for holding said bridge conductor in said second axial position.

4,311,891
VEHICLE ALARM SHAKER DEVICE WITH SPRING DAMPER

James H. Faust, Maricopa, Ariz., assignor to ABC Auto Alarms, Inc., Elk Grove Village, Ill.

Filed Apr. 17, 1980, Ser. No. 141,114
Int. Cl.[3] H01H *35/02*
U.S. Cl. 200—61.45 R 6 Claims



1. In a shaker device for a vehicle equipped with an alarm system in which there is a housing adapted to be mounted to a grounded structural member of the vehicle, the housing has an elongate, substantially flat vibratory member anchored at one end thereof within the housing and having a weight at its free end whereby movement of the vehicle will cause the free end to vibrate in a vertical plane, there is a fixed contact carrying member within the housing having a first electrical contact facing the vibratory member, the vibratory member carrying a second electrical contact juxtaposed relative to the first electrical contact, the contacts adapted to come into engagement when the vibratory member makes a sufficient upward excursion, the two contacts being insulated from one another when not engaged and the shaker device having means for extending electrical connections from the contacts to an alarm circuit so that engagement of the contacts will close the circuit at least momentarily, the shaker device having means for damping and limiting the excursions of the vibratory member, the invention being an improvement upon said damping and limiting means and comprising:
- a cantilever supported member of resilient material connected to the vibratory member at the end where same is anchored and disposed on the bottom thereof being partially in engagement with the bottom of the said vibratory member and diverging therefrom, the supported member being substantially shorter than the vibratory member and adapted to be progressively engaged along its length with the vibratory member in direct relation to the amount of excursion of the vibratory member downward so that the

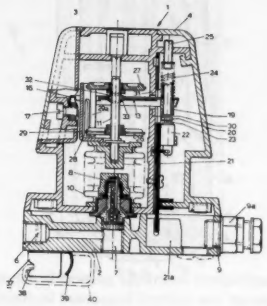
resistance of the supported member to such excursion increases with an increase in excursion of the vibratory member.

4,311,892

PRESSURE LIMITING SWITCH FOR AN INSTRUMENT AIR CIRCUIT

Pieter Engelander, Veenendaal, Netherlands, assignor to Beta, B.V., The Hague, Netherlands

Filed Mar. 10, 1980, Ser. No. 129,036
Claims priority, application Netherlands, Apr. 11, 1979, 7902857
Int. Cl.³ H01H 35/32
U.S. Cl. 200—81.4 7 Claims



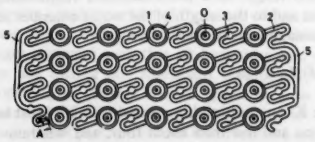
1. Fluid pressure limiting switching means including a microswitch and comprising a switching arm, means pivotally mounting one end of said switching arm for movement about a fixed point with the opposite end of said arm being in position to actuate the microswitch, an actuating rod axially moveable under the influence of fluid pressure to be monitored for moving said switching arm about said fixed pivot point, an opening in the arm through which said rod extends, said rod being moveable with respect to the arm, said opening providing clearance between the rod and the arm so that the rod and arm do not contact each other throughout all positions of the rod, a pair of abutments located on said rod on opposite sides of said arm, said abutments being adjustable axially of the rod and being movable with the rod into positions of contact with the arm for pivotal movement of the arm toward and away from microswitch actuating position.

4,311,893

PUSH BUTTON ASSEMBLY

Hidetaka Tsuchiya, and Kouichi Nakajima, both of Tanashi, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Apr. 15, 1980, Ser. No. 140,676
Claims priority, application Japan, Jun. 22, 1979, 54-85608[U]
Int. Cl.³ H01H 9/00, 13/14
U.S. Cl. 200—340 4 Claims



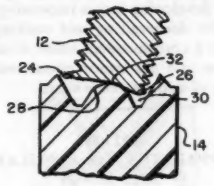
1. A push button assembly made of plastic comprising a plurality of push buttons; a pair of resilient connecting branches formed on opposite portions of each push button, said resilient connecting branches being symmetrical about the central point of the top of said push button, each of said resilient connecting branches being in a plain perpendicular to the axial line of said push button, adjacent connecting branches being connected with each other; and a supporting means extending parallel to the axial line of said push button provided at each junction of said adjacent connecting branches for supporting the connecting branches.

4,311,894

SWITCH BUTTON CONSTRUCTION

Harry Greenwald, Whitestone, N.Y., assignor to Greenwald Electro-Mechanical Consultants, Inc., Whitestone, N.Y.

Filed Jun. 18, 1980, Ser. No. 160,641
Int. Cl.³ H01N 3/12, 13/14
U.S. Cl. 200—340 4 Claims



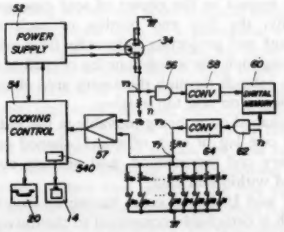
1. In a pushbutton switch of the type wherein a pushbutton is depressed to operate a switch mechanism and which pushbutton is engaged and depressed by an adjustment screw extending through a moving device, the improvement comprising: said pushbutton having a crown formed with a central contact portion engageable with the central end portion of the screw, said crown further having a circumferential groove disposed about said central contact portion, said central contact portion and said circumferential groove of said crown moving together relative to the switch when said pushbutton is depressed, said circumferential groove providing clearance for receiving the edge end portions of the screw when said pushbutton is depressed, whereby the central end portion of the screw remains in contact with the central contact portion of the pushbutton to permit precise adjustment of said screw in controlling the operation of the switch mechanism.

4,311,895

COOKING UTENSIL CONTROLLED BY GAS SENSOR OUTPUT

Takeshi Tanabe, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 31, 1979, Ser. No. 71,179
Claims priority, application Japan, Sep. 5, 1978, 53/109404; Dec. 19, 1978, 53/158008; Dec. 20, 1978, 53/159626
Int. Cl.³ H05B 6/68
U.S. Cl. 219—10.55 B 10 Claims



1. A cooking apparatus comprising:
oven cavity means for receiving a foodstuff to be cooked;
cooking energy source means for conducting a cooking

operation on said foodstuff disposed in said oven cavity means, said foodstuff producing a reducing gas in amounts representative of the cooked state thereof;

gas sensor means responsive to the presence of said reducing gas generated from said foodstuff, for providing an output signal representative of the concentration of said reducing gas in said oven cavity;

control circuit means for controlling the operation of said cooking energy source means as a function of said concentration of reducing gas, said control circuit comprising:

reference means for providing a reference signal of a selected value;

comparing means for comparing said output signal from said gas sensor means with said reference signal; selection means for selecting said reference signal in accordance with the kind of foodstuff to be cooked; and

control signal developing means responsive to said comparing means for deenergizing said cooking energy source means when a corresponding value of said output signal derived from said gas sensor means reaches said preselected value of said reference signal.

4,311,896

HEATING APPARATUS FOR ANNULAR BEARINGS AND RINGS

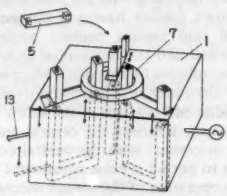
Seta Junya, Kishiwada, Japan, assignor to Yugen Kaisha Parusu Giken, Kishiwada, Japan

Filed Apr. 29, 1980, Ser. No. 144,936

Claims priority, application Japan, Jun. 4, 1979, 54-76394[U]; Nov. 5, 1979, 54-153317[U]

Int. Cl.³ H05B *6/14, 6/38*

U.S. Cl. 219—10.57 **2 Claims**



1. A heating apparatus for an annular ring, said apparatus comprising:

a plurality of U-shaped iron cores;

a case for housing said U-shaped cores, said case having a top portion for allowing an annular ring to be heated to be placed thereon, said top portion having at least one opening therein, said at least one opening being dimensioned such that the respective legs of said cores can freely extend therethrough;

said U-shaped cores being positioned in said case such that the legs of each of said U-shaped cores are radially aligned with respect to the center of said case and extend upwardly, the free end portion of each leg extending through and projecting outwardly from said at least one opening such that at least one leg of each of said U-shaped cores extends through the center area of an annular ring positioned on said top portion;

said U-shaped cores being movable in the radial direction;

at least one leg of each of said U-shaped cores having a primary coil therearound, said primary coil being positioned within said case;

each of said U-shaped cores having an iron bridging core which is detachably connected to the outwardly projecting portion of each leg whereby a loop core is formed; and

a voltage source means connected to said primary coil whereby an annular ring positioned on said top portion and around a leg of a U-shaped core is energized.

4,311,897

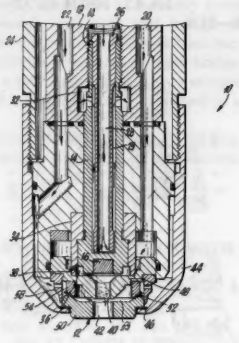
PLASMA ARC TORCH AND NOZZLE ASSEMBLY

Yosef Yerushalmy, Florence, S.C., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 70,526, Aug. 28, 1979, abandoned. This application Jul. 18, 1980, Ser. No. 170,040

Int. Cl.³ B23K *9/00*

U.S. Cl. 219—121 PP **9 Claims**



1. In combination, a plasma torch having a nonconsumable electrode adapted to be connected in circuit with a power supply and workpiece for establishing a transferred plasma arc between the nonconsumable electrode and the workpiece through a nozzle assembly arranged beneath said electrode relative to said workpiece and means for passing a swirling flow of gas around said arc and through said nozzle assembly thereby forming a constricted plasma arc of high current density; said nozzle assembly comprising:

a first arc constricting passageway having a longitudinal axis in alignment with the longitudinal axis of said nonconsumable electrode;

a second arc constricting passageway in coaxial alignment with said first arc constricting passageway, said second arc constricting passageway having an essentially constant diameter throughout its length;

a water chamber separating said first and second arc constricting passageways; and

means for introducing a jet of liquid into said water chamber for enveloping said swirling gas and arc within said second arc constricting passageway; wherein said first and second arc constricting passageways are each of a predetermined length in a predetermined relationship to one another and to the length of the water chamber separating said passageways defined as follows:

$$L_1 = K\,(L_2 + Wg)$$

where K is a multiplying constant which must be greater than one and less than about four, and wherein

L_1 is equal to the length of said first arc constricting passageway;

L_2 is equal to the length of said second arc constricting passageway; and

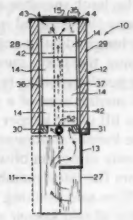
Wg is equal to the length of said water chamber separating said first and second passageways.

4,311,898

ELECTRIC BASEBOARD HEAT STORAGE APPARATUS AND METHOD OF CONVERSION

Charles G. McMillan, Rte. 9, Box 218, Mount Airy, N.C. 27030

Filed Mar. 14, 1980, Ser. No. 130,466
Int. Cl.[3] F24H 7/02, 7/04
U.S. Cl. 219—378 6 Claims



1. An electrical heating apparatus comprising:

(a) an electrical baseboard heating unit having an elongated enclosure mounted against the base of a vertical wall, an electrical resistance heater within and extending the length of the enclosure, said enclosure having top and bottom openings extending along the front and for the length of the enclosure allowing a continuous flow of cool air to circulate into said bottom opening, past said resistance heater to collect and store heat transferred therefrom and to exit out of the said top opening of said enclosure as heated air;

(b) a temperature regulated control connected to and providing continuous cyclical operation of said baseboard unit;

(c) an auxiliary structure supported against the wall on which said baseboard unit is mounted, immediately above and overlying said baseboard heating unit and having wall members forming above said baseboard unit and for the length thereof a vertical, hollow housing having open top and bottom ends and being adapted to receive and provide a vertical channel for heated air rising from said baseboard unit enclosure top opening;

(d) air diverter means formed and mounted on the front of and in association with said auxiliary structure and baseboard unit in a manner enabling substantially all of the heated air exiting the top opening of said baseboard heating unit enclosure to be directed into the open bottom end of said hollow housing; and

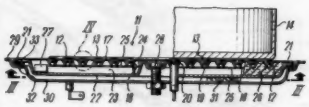
(e) a mass of heat retentive material supported within and occupying a major portion of the space within said hollow housing and having associated vertically oriented air passages arranged such that air heated by said resistance heater and exiting said baseboard heating unit enclosure top opening is allowed to rise upwardly into the open bottom end of said housing, through said air passages, contact at least portions of said heat retentive material and thereby heat such heat retentive material and thereafter be discharged through the said top end of said hollow housing such that when said resistance heater is off, heat stored in said heat retentive material may be employed as a supplemental source of heat for air flowing through said hollow housing.

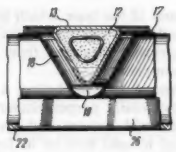
4,311,899

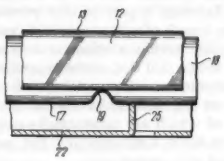
COOKING APPARATUS

Gerhard Goessler, Oberderdingen, Fed. Rep. of Germany, assignor to E.G.O. Elektro-Gerate, Blanc und Fischer, Fed. Rep. of Germany

Continuation of Ser. No. 961,837, Nov. 17, 1978, abandoned.
This application Apr. 21, 1980, Ser. No. 141,870
Int. Cl.[3] H05B 3/72
U.S. Cl. 219—461 25 Claims







1. A self-cleaning cooking apparatus, comprising:

a substantially flat, thin-walled heat reflective plate provided with grooves and forming a closed surface;

a plurality of longitudinally spaced support projections disposed in the grooves;

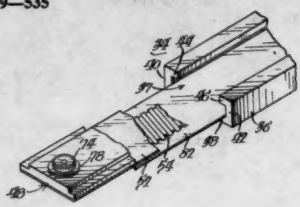
flattened tubular heating bodies, having at least one upper and lower heat radiating surface, permanently attached to the plate by a sealed connection therethrough, but otherwise arranged to only rest on the support projections in the grooves and forming a cooking surface for receiving a cooking vessel, all contacts made between the support projections of the plate and the heating bodies effectively forming only point contacts which minimize heat flow from the heating bodies to the plate; and,

the grooves, heating bodies and point contacts defining free air spaces therebetween open to a substantial extent to both lateral sides of the heating bodies, the upper surface of the heating bodies heating the cooking vessel directly and the lower surface of the heating bodies heating the cooking vessel indirectly, the heat therefrom being radiated downwardly and reflected upwardly by the reflective grooves through the free spaces, the heat supply to the cooking vessel not exceeding normal cooking temperatures, whereby spilled food entering the free air spaces interrupts the heat reflection due to subsequent cooking at the normal cooking temperatures, automatically raising the temperature in the groove high enough to ash the spilled food, the ash being easily removable therefrom, not withstanding the permanently attached heating bodies, which rest on the support projections in the grooves.

4,311,900
HEATER BAND

Matt N. Hummel, Glenview, Ill., assignor to Acra Electric Corporation, Schiller Park, Ill.

Division of Ser. No. 930,684, Aug. 3, 1978, Pat. No. 4,204,316.
This application Jan. 18, 1980, Ser. No. 115,092
Int. Cl.[3] H05B 3/58
U.S. Cl. 219—535 6 Claims



1. In a heater band of the type which includes an electrical resistance heating element surrounded on its top, bottom and sides by and electrically insulated from a metal jacket, an improved jacket comprising:

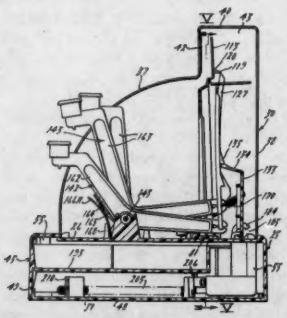
an integrally formed base including a bottom, two sides extending substantially perpendicular to and away from one surface of said bottom and flanges projecting inwardly parallel to said bottom to form a T-shaped slot between said flanges and between said flanges and said bottom; and

a cover extending from side to side between said flanges and said bottom wherein said cover includes a central core disposed between a pair of side portions, all of which extend the length of said cover, said central core and said side portions having a common bottom planar surface disposed within said slot, said side portions further including upper surfaces disposed beneath said flanges, said central core and said flanges further including upper surfaces all of which are substantially coincident with one another to form a substantially flat surface across said flanges and said central core.

4,311,901
CASH REGISTER MECHANISM

Mikio Ogawa, Masashino, Japan, assignor to Western Stamping Corporation, Jackson, Mich.

Filed Dec. 11, 1979, Ser. No. 102,396
Int. Cl.[3] G06C 27/00
U.S. Cl. 235—12 11 Claims

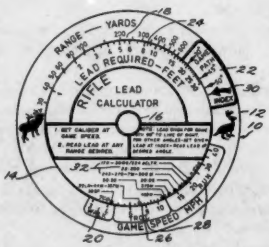


1. In a cash register mechanism, in combination with a supporting and housing structure including a windowed viewing area, a plurality of targets actuatable to and from observable positions with respect to the viewing area, and means including a plurality of pushrods, one of which is operatively connected to each target and movable longitudinally to actuate the target to and from observable position, characterized by a medial area incorporated in each pushrod which area is resiliently flexible laterally of its length, said pushrods being relatively stiff longitudinally and being biased longitudinally in one direction to actuate the targets away from observable position and movable longitudinally in the opposite direction to actuate the targets to observable position, a latch member movable laterally of the pushrods to and from a latching position in which it engages said medial areas of the pushrods, a cam-type latching keeper abutment on each pushrod in said medial area thereof and projecting toward and engageable with the latch member and tending to cam the latch member away from the pushrod and also tending to bow the pushrod in the opposite direction when the pushrod is longitudinally actuated in such opposite direction, means biasing the latch member toward the pushrods and to a latching position with a force exceeding the force required to bow said medial area of a pushrod through a distance equal to the cam lift of the keeper abutment, whereby the camming effect of the keeper abutment during movement of a pushrod in such opposite direction bows the medial portion of the pushrod away from the latch member without moving the latch member away from said latching position, the lift developed by the cam action of said keeper abutments being insufficient to bow the pushrods beyond their elastic limit, and the keeper abutments having abutment surfaces which overengage the latch member to establish a latched condition when the bowed pushrods straighten after completion of the camming action which occurs during such movement thereof in said opposite direction.

4,311,902
LEAD CALCULATOR FOR MOVING TARGETS

Laurel A. Koll, Ruleville, Miss., assignor to LeadRite Corporation, Ruleville, Miss.

Continuation-in-part of Ser. No. 11,673, Feb. 12, 1979. This application Apr. 4, 1980, Ser. No. 137,460
Int. Cl.[3] G06C 27/00
U.S. Cl. 235—78 R 18 Claims



1. A device for calculating the required lead when shooting a projectile at a moving target, as a function of target speed, target range, projectile speed and the direction of movement of the target, comprising:

five scales including:

a first logarithmic scale having indicia associated therewith representing the speed of the target;

a second logarithmic scale having numerical indicia associated therewith representing the required lead;

a third logarithmic scale having numerical indicia associated therewith representing target range;

a fourth logarithmic scale having indicia associated therewith representing projectile speed; and

a fifth logarithmic scale having indicia associated therewith representing the direction of movement of the target relative to the direction of movement of the projectile;

said first, second, third, fourth and fifth scales being formed on at least one member and disposed in physical proximity with each other so that they are correlated, the correlated

numerical value associated with one of the scales being readily determinable if the correlated numerical value associated with each of the other four scales is known.

4,311,903

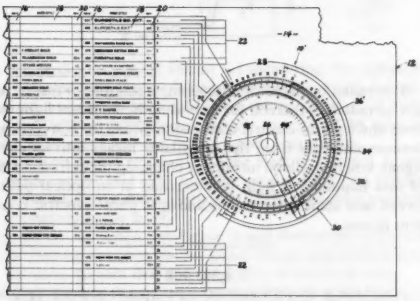
METHOD AND APPARATUS FOR COPY-FITTING

Charles R. Seely, 6870 Dorinda Dr., Riverside, Calif. 92503

Division of Ser. No. 848,904, Nov. 7, 1977, Pat. No. 4,216,373. This application Apr. 3, 1980, Ser. No. 136,800

Int. Cl.³ G06C *3/00*

U.S. Cl. 235—88 R **1 Claim**



1. A copyfitting calculator comprising:

a first circular disk having a first graduated scale of Font ID numbers extending along a portion of the edge thereof, and a second graduated scale of type size, in points, extending along the remainder of said edge, said Font ID numbers being a function of the width, in points, of the alphabet length of various fonts, ranging from the most condensed to the most extended styles in general use;

a second circular disk concentric with said first disk and rotatable with respect thereto, said second circular disk being smaller in diameter than said first disk, and having a third graduated scale of line length, in picas, extending along a portion of the edge thereof, and a fourth graduated scale of characters per line for the remainder of said edge;

a third circular disk concentric with said first and second disk members and rotatable with respect thereto, said third disk being smaller in diameter than said second disk, and having fifth and sixth graduated scales arranged in the form of concentric circles, said fifth scale representing characters per pica, and said sixth scale representing character width in picas; both said fifth and sixth scales ranging from 0.10 to 10, with their 0.10/10 graduation marks radially aligned with respect to one another, and said fifth and sixth scales increasing numerically in opposite directions;

a first cursor fixedly attached to said third disk and rotatable therewith, said first cursor having an index line extending radially over the graduated scales on all three circular disks, said index line being positioned on said 0.10/10 graduation of both said fifth and sixth scales; and

a second cursor located above said first cursor and freely rotatable with respect to said first, second and third disks, said cursor having an index line extending radially over the graduated scales on all three circular disks, whereby graduations on any one scale can be aligned with corresponding graduations on another scale.

4,311,904

AUTOMATIC FOCUS ADJUSTING DEVICE

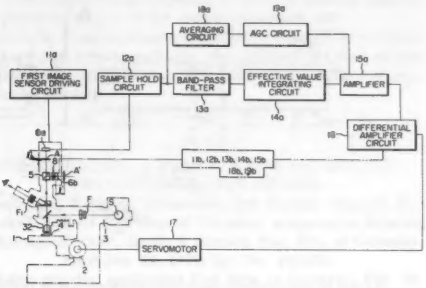
Masashi Okada, Yotsukaido; Yuji Akiyama; Takaharu Kawada, both of Kawasaki, and Atsushi Kawahara, Tokyo, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 4, 1979, Ser. No. 100,007

Claims priority, application Japan, Dec. 5, 1978, 53-149686

Int. Cl.³ G01J *1/36*

U.S. Cl. 250—204 **6 Claims**



1. An automatic focus adjusting device for forming the image of a sample to be examined at a predetermined imaging position, comprising:

(a) an image forming optical system for forming the image of said sample;

(b) a first image sensor disposed rearwardly of said predetermined imaging position;

(c) a second image sensor disposed forwardly of said predetermined imaging position;

(d) magnification changing means substantially equalizing the sizes of the images of said sample on said first and second image sensors;

(e) a signal processing system for processing the output signals of said two image sensors and putting out a first output corresponding to the signal of said first image sensor and a second output corresponding to the signal of said second image sensor;

(f) differential amplifier means for differentially amplifying said first and second outputs; and

(g) servo means for moving said sample in the direction of the optic axis of said optical system by the difference signal of said differential amplifier means.

4,311,905

FILM STRIP POSITIONING FOR X-RAY TESTING OF PIPES

Karl Ries, Mülheim; Kurt Hannoschöck, Sonsbeck; Krsto-Marijan Rozic, Düsseldorf; Günter Basler, Ahrensburg; Harald Sperl, Grosshansdorf, and Kurt Weinschenk, Schenefeld, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf and Rich. Seifert & Co. GmbH & Co. KG, Ahrensburg, both of, Fed. Rep. of Germany

Filed Jul. 31, 1978, Ser. No. 880,549

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1977, 2706346

Int. Cl.³ G03B *41/16*

U.S. Cl. 250—321 **9 Claims**

1. Apparatus for X-ray testing of pipes, including a source of X-rays, a reversible roller track, and means for rotating the pipe on its axis to provide for a particular azimuthal position of the pipe, further comprising:

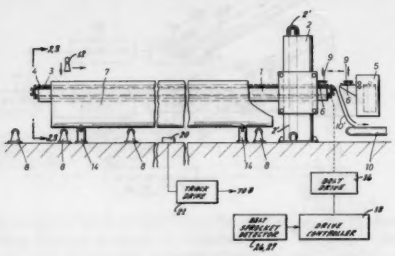
a horizontal cantilever arm mounted for up and down movement on a stand while maintaining a horizontal disposition, and extending above said track parallelly thereto;

a movable endless belt on the arm with individual film strip holder means on the belt for holding and/or supporting

film strips or the like in variable dispositions a pipe when on the roller track and when having been moved towards the stand receiving the arm and the belt in its interior;

means disposed adjacent to the endless belt, outside said piece, for placing film strips or the like onto the belt;

controlled drive means for the belt to move the belt so that individual holding means on the belt traverse particular distances from a disposition adjacent to said means for



placing to respectively particular predetermined positions adjacent to the pipe; and

control means for operating the means for placing, to cause individual film strips to be placed onto particular ones of the holding means, for subsequent movement by the drive means and positioning by the belt into the predetermined positions respectively adjacent to predetermined portions of and inside the pipe.

4,311,906

MOSAIC OF RADIATION DETECTORS READ BY A SEMICONDUCTOR DEVICE AND A PICTURE PICKUP SYSTEM COMPRISING A MOSAIC OF THIS TYPE

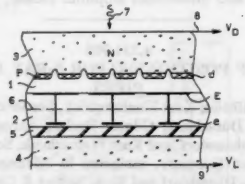
Pierre Felix, and Guy Le Parquier, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 24, 1980, Ser. No. 162,653

Claims priority, application France, Jun. 27, 1979, 79 16560

Int. Cl.³ G01J *1/00*; G01T *1/22*

U.S. Cl. 250—349 **17 Claims**



1. A mosaic of radiation detectors read by a semiconductor device, comprising an array of detectors which are exposed to the radiation and each deliver an electrical signal, said array being formed on a substrate so arranged as to be separate and distinct from a semiconductor readout substrate used to read said array and which is covered with an oxide layer, a first insulating layer having high capacitance per unit area separates the surface of the mosaic on which the detectors are formed from the oxide layer which covers said semiconductor readout substrate, and a first array of metallic electrodes collect by capacitive coupling the electrical signals delivered by the detectors at the surface of the first insulating layer on the side corresponding to the readout device.

4,311,907

RADIATION DETECTOR HAVING REFRACTIVE INDEX MATCHING MEANS

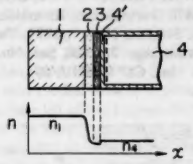
Katsumi Takami, Tokyo; Yoshitoshi Ito, Ohme; Kenji Ishimatsu, Abiko, and Eiichi Tanaka, Mitaka, all of Japan, assignors to Hitachi Medical Corporation, Tokyo and National Institute of Radiological Sciences, Chiba, both of, Japan

Filed Mar. 26, 1980, Ser. No. 134,283

Claims priority, application Japan, Mar. 30, 1979, 54-38102

Int. Cl.³ G01T *1/20*

U.S. Cl. 250—368 **8 Claims**



1. A radiation detector comprising a scintillator means sensitive to radiation thereon for providing luminescent light therefrom and a photo-electric conversion means for converting the luminescent light from the scintillator means into an electric signal, wherein silicon nitride for changing the refractive index of said luminescent light is interposed in an optical path between said scintillator means and said photo-electric conversion means.

4,311,908

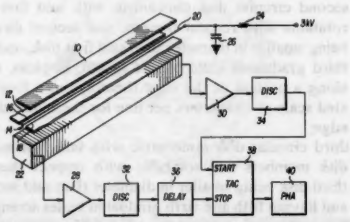
SIMPLE ELECTRONIC APPARATUS FOR THE ANALYSIS OF RADIOACTIVELY LABELED GEL ELECTROPHORETOGRAMS

Konstantin Goulianos; Karen K. Smith, and Sebastian N. White, all of New York, N.Y., assignors to The Rockefeller University, New York, N.Y.

Filed Mar. 4, 1980, Ser. No. 127,042

Int. Cl.³ G01T *1/18*

U.S. Cl. 250—374 **9 Claims**



1. A high resolution position sensitive radiation detector for analyzing radiation emanating from a source, comprising:

a plate having an elongated slot with conductive edges acting as a cathode;

a charged anode wire positioned adjacent said source and running parallel to said slot and centered within said slot in said plate;

an ionizable gas surrounding said anode wire in said slot said gas ionized by radiation emanating from said source into said gas;

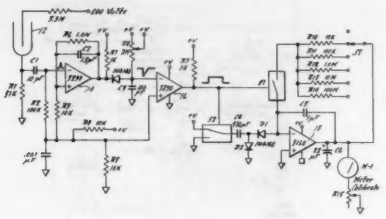
induction means for detecting ionization produced in said gas by said radiation and for producing resulting ionization signals; and

processing means coupled to said induction means for receiving ionization signals induced therein and for determining from said ionization signals the location along said anode wire of radiation emanating from said source.

4,311,909
GEIGER-MUELLER TUBE COINCIDENCE LOSS CORRECTION CIRCUIT

George R. Utting, Satellite Beach, and Scott M. Graham, Titusville, both of Fla., assignors to Victoreen Incorporated, Cleveland, Ohio

Filed Jul. 23, 1980, Ser. No. 171,366
Int. Cl.[3] G01T 1/18; H01J 47/02
U.S. Cl. 250—374 5 Claims



1. An analog ratemeter circuit for measuring the radiation level detected by a Geiger-Mueller (GM) tube which is characterized by a dead time following the production of each electrical output pulse during which time the GM tube is unable to produce another output pulse, comprising:

first circuit means responsive to the electrical output pulses produced by said GM tube for producing a first output pulse whenever the amplitude of a GM tube pulse exceeds a predetermined level;

second circuit means responsive to said first output pulse for producing a second output pulse having a predetermined duration greater than the dead time of said GM tube;

analog rate circuit means responsive to said second output pulse signal for producing an analog output signal proportional to the pulse rate of said second output pulse signal;

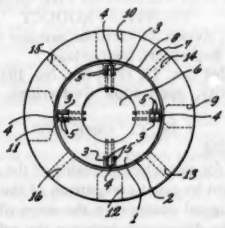
an analog meter responsive to said analog output signal for providing a reading proportional to said analog output signal; and

electronic switch means connected in circuit with said analog rate circuit means and responsive to said second output pulse signal for maintaining substantially constant the magnitude of said analog output signal during said predetermined duration of said second output pulse.

4,311,910
FIELD DESORPTION IONIZATION

Hans B. Linden, Dulonweg 2, 2800 Bremen 61, Fed. Rep. of Germany

Filed Apr. 3, 1980, Ser. No. 137,255
Int. Cl.[3] H01J 27/00
U.S. Cl. 250—423 R 8 Claims



1. Apparatus for carrying out field desorption ionization, comprising:

an annular case having a plurality of radially extending, separated process chambers including (i) a first chamber for activating an electrode, (ii) a second chamber for depositing analyzing substance onto an activated electrode, (iii) a third chamber for ionizing the substance by means of field desorption ionization, and (iv) a fourth chamber for cleaning an electrode, accessible on the inside;

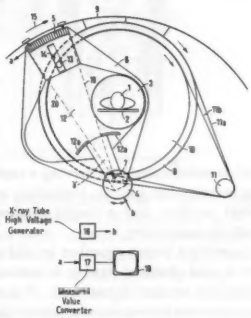
carrier means having a plurality of supplemental process chambers for and containing electrode means, the supplemental chambers being arranged along the inside of the case so that different portions of the electrode means face different ones of the process chambers in said annular case to be concurrently subjected to different process steps as provided by and in the various chambers; and

means for stepwise placing the different supplemental chambers and, correspondingly, the different portions of the electrode means sequentially in front of the several process chambers.

4,311,911
TOMOGRAPHIC APPARATUS FOR PRODUCING TRANSVERSE LAYER IMAGES

Hans-Jochen Krumme, Uttenreuth, and Guenter Schmitt, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 21, 1979, Ser. No. 105,890
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1979, 2907206
Int. Cl.[3] A61B 6/00
U.S. Cl. 250—445 T 8 Claims



1. Tomographic apparatus for producing transverse layer images of a radiography subject, having a radiation measuring arrangement comprising a radiation source which produces a fan-shaped beam of rays which penetrate the radiography subject and exhibiting an aperture angle (γ), the cross sectional dimension of the beam perpendicular to the layer plane being substantially equal to the layer thickness, and also comprising a radiation receiver with a row of radiation detectors which determines the radiation intensity behind the subject, and having beam shifting means for moving the beam of rays in the layer plane for the purpose of scanning a layer area which is greater than the layer area penetrated by the fan-shaped extent of the beam of rays, and also having a rotatable ring mounting the measuring arrangement for rotational movement to irradiate the radiography subject from different directions, and having a measured value converter for transforming the signals supplied by the radiation receiver into a layer image, the beam shifting means comprising a rotatable support (6) which is pivotally mounted on the rotatable ring (8) for producing pivotal movement of the measuring arrangement (4, 5), characterized in that the beam shifting means comprises a swivel joint (7) for the rotatable support and a beam shifting ring (10) disposed concentrically with said rotatable ring (8), one ring (8) carrying the swivel joint (7) and the other ring (10) having a drive element (13) for pivoting said rotatable support (6) about said swivel joint (7), and means whereby the rings are

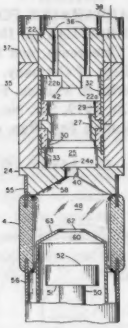
driven at different angular velocities to effect shifting movement of the rotatable support (6) relative to said rotatable ring (8).

4,311,912

NEUTRON ACCELERATOR TUBE HAVING IMPROVED TARGET SECTION

Wyatt W. Givens, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 8, 1980, Ser. No. 147,904
Int. Cl.[3] G21G 4/02
U.S. Cl. 376—109 7 Claims



1. In a neutron accelerator tube having a replenisher section for supplying accelerator gas, an ionization section adjacent said replenisher section, and a target section adjacent said ionization section comprising:

(a) means forming a target chamber in said tube,

(b) a target in said chamber having an active surface facing said ionization section formulated of a material which produces neutrons in response to bombardment by ionized accelerator gas,

(c) a cathode member interposed between ionization section and said target chamber, said cathode member having a recessed convergent surface exposed to said target chamber which converges down to a point at which an aperture in said cathode member extends from said target chamber to said ionization section to provide for the flow of ionized gas from said ionization section into said target chamber, said cathode thereby giving a concave-like appearance when viewed from said target chamber, and

(d) an extraction electrode in said target chamber interposed between said target and said cathode member and having a divergent projecting surface facing said recessed cathode surface which projects outward to a point at which an aperture therein extends from said target chamber toward said target, said electrode thereby giving a convex-like appearance when viewed from said cathode, whereby the relationship between said cathode member and said extraction electrode surfaces concentrates the electric field in said target chamber through the central portion thereof so as to enhance the acceleration and extraction of ions through said cathode aperture to said target, and

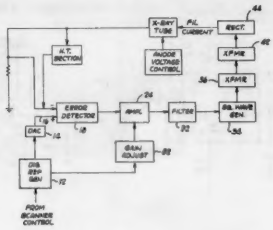
whereby the field strength in the peripheral regions of said target chamber is maintained at an acceptable level without internal arcing associated with field emission breakdown.

4,311,913

X-RAY TUBE CURRENT CONTROL

Theodore A. Resnick, and Walter A. Dupuis, both of Cleveland Heights, Ohio, assignors to Picker Corporation, Cleveland, Ohio

Filed Oct. 4, 1979, Ser. No. 81,674
Int. Cl.[3] H05G 1/30
U.S. Cl. 250—409 2 Claims



2. Feedback control circuitry for controlling the tube current output of an x-ray tube by filament voltage adjustment, the tube being couplable to power circuitry for energizing the filament and applying tube voltage from anode to cathode, the tube also having a predictable nonlinear tube current output characteristic with respect to filament voltage, constituting a first function, said circuitry comprising:

(a) a generator for producing an adjustable reference signal representing a desired tube current for output during active production of x-rays;

(b) means for sensing actual tube current output;

(c) an error detector for producing an error signal which is a function of the difference between the sensed tube current and the current represented by the reference;

(d) a forward loop portion including an amplifier for driving filament voltage as a function of the error signal; and

(e) compensation circuitry for adjusting the electronic forward loop gain of the feedback loop circuitry for maintaining as substantially a constant the gain of the entire loop comprising said sensor, error detector, forward loop portion and x-ray tube, over a range of reference signal values, in order to maintain a substantially uniform transient response of x-ray tube current output during active production of x-rays.

4,311,914

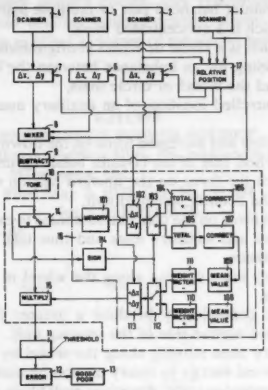
PROCESS FOR ASSESSING THE QUALITY OF A PRINTED PRODUCT

Josef A. Huber, Zurich, Switzerland, assignor to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Dec. 11, 1979, Ser. No. 102,418
Claims priority, application Switzerland, Dec. 18, 1978, 12833/78
Int. Cl.[3] G06K 5/00
U.S. Cl. 250—556 18 Claims

1. A process for assessing the quality of the print of a printed product by point-by-point comparison of the specimen under test and an original comprising the steps of forming values representing the differences between the reflectances of the individual image points of the specimen produced by point-by-point photoelectric scanning and the reflectances of the image points of the original corresponding to the image points of the specimen; producing individual weights by statistical analysis of a number of printed products which are known to be qualitatively satisfactory, adjusting the weights so that the faultless

printed products are also assessed by the process as faultless, and allocating respective individual weights to the difference



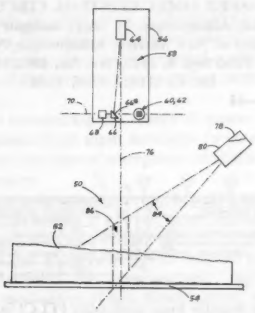
values obtained from each individual image point or from groups of image points.

4,311,915

ELECTRO-OPTICAL PRESENCE DETECTION SCANNER

Richard L. Stratton, Lake Oswego, Oreg., assignor to Dyna-Tech Corp., Portland, Oreg.

Continuation of Ser. No. 634,066, Nov. 21, 1975, abandoned.
This application Nov. 15, 1979, Ser. No. 94,547
Int. Cl.[3] G01N *21/86*
U.S. Cl. 250—561 5 Claims



1. An electro-optical monitoring system for noting only the presence of an article in an observation zone comprising

means adjacent said zone for supporting an article thereon,

means for projecting into said zone a beam of optical radiation having essentially no more than two dimensions, said beam, when viewed from at least one side thereof, further having substantially the appearance of a straight line, and

reflection detector means sensitive to such radiation and having a defined wide-expanse field of view which intersects said beam along a finite length thereof measured on the projection axis of the beam, such intersection producing a sensitivity region in said zone so that when the article is shifted into said sensitivity region to intersect said sensitivity region said detector means will receive reflected radiation,

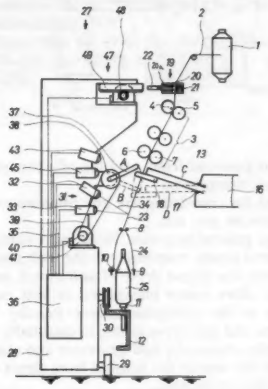
said projecting means and said detector means being oriented relative to one another whereby the latter is unable to view directly radiation projected by the former and only can perceive radiation emitted from the former after reflection from the article positioned within said sensitivity region, and said sensitivity region being spaced from said support means a distance for substantially preventing debris on said support means from intersecting said sensitivity region.

4,311,916

TRAVELLING SCANNING APPARATUS FOR SUCCESSIVELY SCANNING THE WORKING CONDITIONS AT EACH SPINNING POSITION OF A RING SPINNING MACHINE

Eduard Schenkel, Seuzach, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Mar. 17, 1980, Ser. No. 130,822
Claims priority, application Switzerland, Mar. 27, 1979, 28201/79
Int. Cl.[3] G01N *21/86*
U.S. Cl. 250—561 12 Claims



1. A travelling scanning apparatus for successively monitoring the working conditions at each spinning position of a ring spinning machine with respect to yarn breakages and lap-up formations on drafting arrangement rolls to which there is infed roving from a roving supply, comprising:

a first yarn feeler for checking, without contacting the yarn, the presence of a yarn between delivery rolls of the drafting arrangement and a spindle;

a second yarn feeler which, in the event a yarn breakage is detected, checks for the presence of a fibre stream between the delivery rolls of the drafting arrangement and a broken yarn suction nozzle;

a broken yarn suction nozzle arranged directly below the bottom delivery roll in its normal working position and movable into a scanning position;

a fibre stream deflecting device for deflecting the fibre stream such that said fibre stream can be acted upon by said broken yarn suction nozzle;

an interrupting device for interrupting the roving supply provided at each spinning position of the ring spinning machine;

an actuation device for activating, in the event of absence of the fibre stream, said interrupting device for interrupting the roving supply;

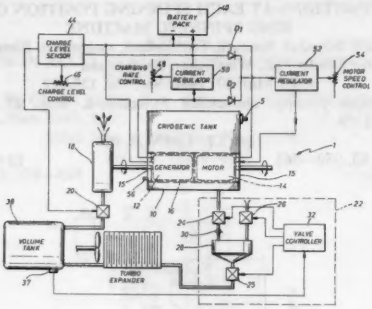
said fibre stream deflecting device, when activated by the scanning apparatus, lowering the broken yarn suction nozzle from its normal working position into said scanning position which is sufficiently lowered from the bottom delivery roll for the contactless detection of the fibre stream by said second yarn feeler; and

said second yarn feeler comprising beam source means for emitting a beam onto the deflected fibre stream and beam receiver means for receiving a beam influenced by the deflected stream of fibres.

4,311,917
NON-POLLUTION MOTOR

Thomas R. Hencey, Jr., 1601 Water St., Galveston, Tex. 77550, and William J. Murphy, Galveston, Tex., assignors to Thomas R. Hencey, Jr., Galveston, Tex.

Filed Mar. 31, 1980, Ser. No. 135,233
Int. Cl.[3] F25B *11/00, 19/00*
U.S. Cl. 290—1 A 26 Claims



1. A motor powered from a source of a low pressure liquified cryogenic comprising:

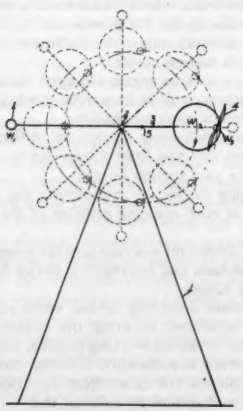
(a) a means for converting the low pressure cryogenic into high pressure gas; and

(b) a power generating means, including a voltage generator and a drive motor, responsive to the high pressure gas, for generating the output drive of said motor, said generator and said drive motor maintained in heat exchange relationship to the cryogenic source thereby to cool said generator and said drive motor to essentially the temperature of the cryogenic, said generator and said motor contained in the source but isolated from direct contact with the liquified cryogenic.

4,311,918
WIND POWERED GENERATOR WITH GRAVITY ASSISTED MECHANICAL ADVANTAGE BOOSETER

Vesper A. Vaseen, 9840 W. 35th Ave., Wheatridge, Colo. 80033

Filed Aug. 7, 1980, Ser. No. 176,134
Int. Cl.[3] F01D *7/00;* F03D *7/04*
U.S. Cl. 290—55 11 Claims



1. What is claimed is the method of converting wind energy to mechanical energy by the use of the mechanical advantage of the wind energy providing a continuously off-balance condition wherein gravity is put to work assisting the wind energy in the production of energy for useful work such as mechanical rotary motion or generation of electrical energy by the;

use of a counter balanced pair or multiple pairs of weights,

one of which is a concentrated mass,

one of which is a circle or wheel configuration mass,

then providing for an imbalance between the concentrated mass, and the wheel or circle mass,

by the controlled location of an auxiliary mass within the wheel,

such as to first add increased force on the downward motion of the wheel side of the counter balanced unit.

then reduce the force on the upward motion of the wheel side of the counter balanced unit,

causing the force on the concentrated mass to exceed that on the wheel and auxiliary mass and thus take on a downward rotation,

the auxiliary mass moving along the wheel in predesigned locations,

such as to continuously produce a greater force on the downward motion side of the rotating unit,

the auxiliary mass moving along the wheel by the conversion of wind energy to rotary motion by means of a propeller, savonious rotor, American mult blade rotor, Dutch four arm rotor, high speed two or more blade propeller, Darrious rotor, Vortex tower rotor, or any other similar device,

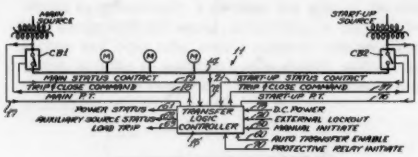
and located at specific balance points or locations within or without the wheel by means of gears, chains, belts, pneumatic, or hydraulic device or combination of devices,

thus using the mechanical advantage of mass times its distance or lever arm, with the mass acted on by gravity, to convert wind energy to useful work.

4,311,919
TRANSFER LOGIC CONTROL CIRCUITRY

George R. Nail, Albuquerque, N. Mex., assignor to Public Service Company of New Mexico, Albuquerque, N. Mex.

Filed Sep. 8, 1980, Ser. No. 185,284
Int. Cl.[3] H02J *3/06, 9/06*
U.S. Cl. 307—64 12 Claims



1. A power transfer logic controller (TLC) including a first source of power for energizing a motor bus and a second source of power selectively connectable to energize said motor bus such as in the event of a fault in said first source, said TLC comprising in combination, means for initiating a fast transfer operation including means for comparing the phase of the second source of power with the phase of the residual voltage on said motor bus, means for initiating a fast transfer if said phases are within a selected range of one another, means for initiating a synchronous transfer, transfer relay means for determining indication that the frequency of said second source is in substantial synchronism with the frequency of said residual bus voltage and initiating a transfer, means for effecting a residual voltage transfer, said residual voltage transfer control comparing the residual voltage on said motor bus to a preset reference and initiating a transfer when said motor bus residual voltage is below said reference, a sequencer means for providing timing windows for said fast transfer control and said synchronous transfer control to effect transfer within the time periods set by said synchronizer, means coupling the output of said residual voltage control to the sequencer to provide an end of period signal to said sequencer to indicate

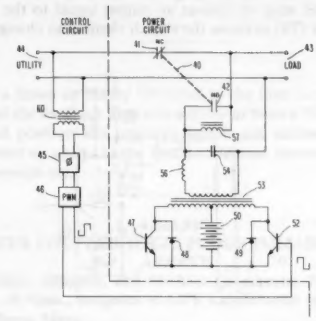
the termination of a preset time period, and means actuable by said fast transfer control circuit, said synchronous control circuit and said residual voltage control circuit to said sequencer means to effect a closure of the circuit breaker to said second source.

4,311,920

EMERGENCY POWER SOURCE

Glenn J. Smollinger, Fairless Hills, Pa., assignor to ESB United States, Inc., Wilmington, Del.

Filed May 2, 1979, Ser. No. 35,288
Int. Cl.³ H02J *9/06*
U.S. Cl. 307—66 **5 Claims**



1. An emergency power source comprising:

a battery;

inverter means for conversion of alternating current utility power of a first comparatively low frequency to direct battery charging current under normal conditions, and for inversion of direct to alternating current under emergency conditons;

a switch for transferring the source of power delivered to load terminals from input terminals to inverter connections upon detection of emergency conditions; and

control circuitry;

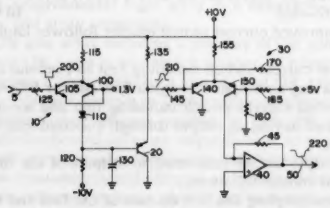
wherein battery charging is accomplished by switched operation of said inverter at a preset phase angle and synchronous to said utility power wave form, to provide direct current to said battery, the power supplied to said battery being controlled by comparatively high frequency switched modulation of said direct current, asynchronous to said power wave form.

4,311,921

SINE-SQUARED PULSE SHAPING CIRCUIT

Birney D. Dayton, Nevada City, Calif., assignor to The Grass Valley Group, Inc., Grass Valley, Calif.

Filed Apr. 9, 1979, Ser. No. 28,283
Int. Cl.³ H03K *5/22, 5/00, 5/08*
U.S. Cl. 307—261 **9 Claims**



1. An electronic circuit for producing controlled rise and fall times with a sine-squared shape from rectangular input current pulses, the circuit comprising:

a means for converting the rectangular input current pulses to trapezoidal current pulses;

a buffer amplifier coupled to said converting means for receiving and buffering said trapezoidal current pulses; and

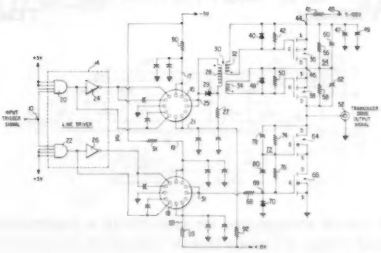
a sine-squared pulse shaping circuit comprising a pair of differentially connected transistors biased so as to operate over the nonlinear portion of their operating range and coupled to said buffer amplifier for receiving and converting said trapezoidal current pulses to sine-squared current pulses.

4,311,922

VARIABLE EXCITATION CIRCUIT

Charles M. Puckette, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 14, 1979, Ser. No. 94,178
Int. Cl.³ H03K *17/687, 3/26*
U.S. Cl. 307—270 **12 Claims**



1. An excitation circuit responsive to an input trigger signal applied during periodically occurring time intervals to provide an output signal in the form of successive, selectively variable pulse burst excitations, said trigger signal being adapted to switch between different logic levels at a selected ultrasonic pulse frequency to apply a selectively determined number of trigger pulses to said circuit during each of said time intervals, said circuit comprising:

a driver section for providing a pair of driver signals, each of said driver signals being adapted to switch between predetermined, intermediate value DC voltage levels of opposite polarity in response to said different trigger signal logic levels;

a power supply including a terminal adapted to provide a selectively variable DC voltage;

an output terminal;

a voltage reference point;

first and second solid state switching means each including gate, source and drain means respectively, said first switching means including at least one P channel MOSFET switching device having a source and drain connection to said power supply terminal and to said output terminal respectively; and

said second switching means including at least one N channel MOSFET switching device having a drain and source connection to said output terminal and to said reference point respectively;

first coupling means, including transformer means, connected or coupling one of the driver section signals to the gate means of said first switching means;

second coupling means, including impedance means connected between the driver section and the second switching means gate means connection, for coupling the other one of the driver section signals to the gate means of the second switching means; and

means for diode coupling the second switching means gate means to said reference point;

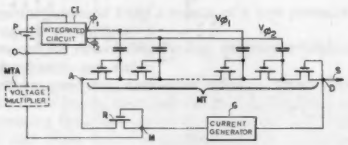
whereby during each of said time intervals said first and second switching means alternate with each other in switching on and off at said selected ultrasonic frequency to provide a pulse burst excitation at said output terminal as a replicated waveform of said trigger signal coherent with the latter, the number of pulses in each burst and the pulse frequency being substantially identical to the selected corresponding values of said trigger signal during each time interval and the amplitude of said pulses being determined by the selected voltage on said power supply terminal.

4,311,923

DEVICE FOR REGULATING THE THRESHOLD VOLTAGES OF I.G.F.E.T. TRANSISTORS CIRCUITRY

Jakob Lüscher, Venthone, and Andreas Rusznyak, Chene-Bougeries, both of Switzerland, assignors to Ebauches SA, Neuchatel, Switzerland

Continuation-in-part of Ser. No. 922,500, Jul. 6, 1978, abandoned. This application Jun. 21, 1979, Ser. No. 50,879
Claims priority, application Switzerland, Jul. 8, 1977, 8454/77
Int. Cl.³ H03K *17/14, 17/30, 3/353*
U.S. Cl. 307—304 **7 Claims**



1. A circuit arrangement for establishing a predetermined threshold voltage for insulated-gate field-effect transistors of a given conductivity type, integrated in a substrate and provided with a common reference terminal, by subjecting said substrate to a controlled biasing potential, comprising:

a regulating IGFET of said given conductivity type having a source and a drain constituting two main electrodes and further having a gate connected to said source;

a current generator having a biasing terminal connected to said substrate and an output terminal connected to said source;

a d-c voltage generator connected across the series combination of said current generator and said regulating IGFET; and

a d-c connection between said reference terminal and one of said main electrodes;

said one of said main electrodes being biased to a potential enabling said regulating IGFET to pass the output current of said current generator.

4,311,924

PULSE AMPLIFIER WITH ZERO CROSSING POINT DETECTION

Werner Breckel, Wendlingen, and Bert Wurst, Möglingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 13, 1979, Ser. No. 48,186
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1978, 2827868
Int. Cl.³ H03K *5/153*
U.S. Cl. 307—354 **6 Claims**

1. Pulse amplifier particularly for connection to an inductive sensor to generate an output signal having a pulse flank timing which has a fixed relationship with respect to substantially sinusoidal signals of varying amplitude and frequency,

in which the substantially sinusoidal signals have half-waves changing polarity at a zero crossing point, said circuit generating an output pulse signal whose trailing edge coincides with the zero crossing point of the signal applied thereto,

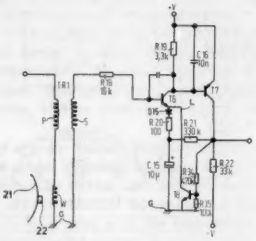
comprising a threshold switch (T6) for receiving the substantially sinusoidal signal;

an amplifier stage (T7) connected to said threshold switch and delivering an output signal when the threshold level of the threshold switch is passed;

means (C15) connected to the threshold switch (T6) establishing a first threshold level, which first threshold level is less than the amplitude of the input signal;

a switch element (T8) coupled to the output of the amplifier stage (T7),

said threshold switch, upon passing of the amplitude of the substantially sinusoidal signal supplied thereto beyond the threshold level, changing state and hence causing the amplifier stage to deliver an output signal to the switch element (T8) to cause the switch element to change state;



coupling circuit means (L) coupling the switch element (T8) to the threshold switch and establishing a second threshold level thereat which corresponds at least approximately to zero or no voltage of the signal supplied thereto and hence to the zero crossover thereover due to the switch element being in said changed state consequent to the output signal furnished by the amplifier stage;

a source of a reference potential (G) connected to said switch element (T8) for direct connection to said threshold switch; p2 wherein said threshold switch includes a capacitor (C15) which, when charged, establishes said first threshold level; and

a coupling diode (D15) connected to said capacitor and isolating the charge on the capacitor from said coupling circuit means (L) and hence the switch element (T8) to prevent interference between said first and second threshold levels when the switch element has changed state and applies the second threshold level to the threshold switch.

4,311,925

CURRENT SWITCH EMITTER FOLLOWER LATCH HAVING OUTPUT SIGNALS WITH REDUCED NOISE

Albert Y. Chang, and Punit J. Pandya, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 17, 1979, Ser. No. 75,921
Int. Cl.³ H03K *21/00, 23/14, 23/08, 23/30*
U.S. Cl. 307—455 **10 Claims**

1. An improved current switch emitter follower latch comprising:

(a) A first current switch including first and second circuits and having an output through a first emitter follower,

(b) a second current switch including first and second circuits and having an output through a second emitter follower,

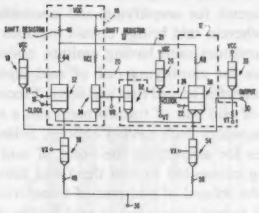
(c) an output circuit connected to outputs of the first and second emitter followers,

(d) means coupling the first circuits of the first and second current switches to each other,

(e) a feedback loop coupling an output of the first circuit as

an input to the second circuit of the second current switch, and

(f) means providing a common input voltage to the first and second emitter followers whereby noise is substantially eliminated in the output circuit when a data input signal is



at a down or binary "0" level to the first current switch and the feedback loop is in a down or binary "0" condition and positive and negative signals are successively provided as inputs to the first and second current switches, respectively.

4,311,926

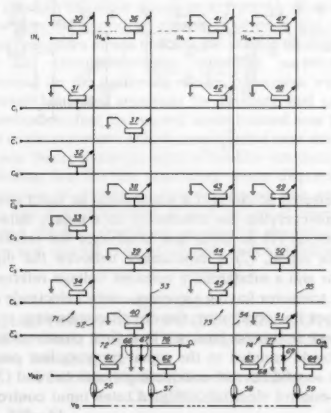
EMITTER COUPLED LOGIC PROGRAMMABLE LOGIC ARRAYS

Lalit Patel, Billerica, and Michael Cooperman, Framingham, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 823,641, Aug. 11, 1977, abandoned. This application Apr. 2, 1979, Ser. No. 26,386

Int. Cl.³ H03K *19/177, 19/086*

U.S. Cl. 307—466 **5 Claims**



1. A programmable logic array in a monolithic integrated circuit, said array comprising:

an OR gate array including a plurality of OR gates, each of said OR gates comprising a number of transistors, each having a base which is an input to said OR gate, a collector coupled directly to a first reference potential, and an emitter, the transistor emitters in each OR gate being selectively coupled to an output thereof, so as to program said programmable logic array, and to a current source, the transistors in said OR gate array being fabricated with one collector region, a plurality of base regions disposed in said collector region such that each base region is common to every OR gate, and a plurality of emitter regions disposed in each of said base regions such that each base region includes one emitter region per OR gate;

a plurality of AND gates, each of said AND gates comprising a number of transistors, each having an emitter which is coupled to one of said OR gate outputs, a base for coupling to a second reference potential, and a collector, the transistor collectors in each AND gate being coupled together to form the output of said AND gate;

a first plurality of input terminals coupled to a first group of inputs of said OR gates;

a second plurality of control terminals coupled to a second group of inputs of said OR gates; and

a third plurality of output terminals coupled to the outputs of said AND gates.

4,311,927

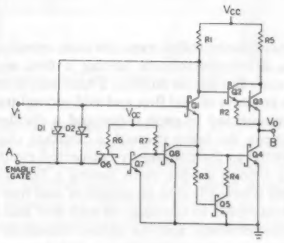
TRANSISTOR LOGIC TRISTATE DEVICE WITH REDUCED OUTPUT CAPACITANCE

David A. Ferris, West Buxton, Me., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Jul. 18, 1979, Ser. No. 58,674

Int. Cl.³ H03K *19/088*

U.S. Cl. 307—473 **15 Claims**



1. In a transistor logic tristate output device of the type suitable for applications on a common bus, comprising an input and an output for transmitting binary data signals of high and low potential in the bistate mode of operation, pullup element for sourcing current to the output from high potential, pulldown element for sinking current from the output to low potential, phase splitter element coupled at the input to control the pullup and pulldown elements in response to signals at the input, said elements comprising junction transistor means, and an enable gate to afford a high impedance third state at the output, said pulldown element transistor means characterized by relatively large base-collector junction capacitance resulting in undesirable parasitic capacitive Miller current to the base of the pulldown element transistor means caused by low to high potential changes on the common bus at the output of the device, the improvement for diverting and discharging the base-collector capacitive feedback Miller current to prevent conduction by the pulldown element when the device is in the high impedance third state comprising:

means coupled between the enable gate on the one hand and the base of the pulldown element transistor means on the other affording a low impedance route to ground from the base of the pulldown element when the enable gate is at low potential and the output device is in the high impedance third state, thereby diverting any Miller feedback current at the base of the pulldown element transistor means to ground;

said coupling means between the enable gate and the base of the pulldown element affording high impedance to current flow in the opposite direction toward the base of the pulldown element transistor means thereby blocking current flow from the enable gate when the enable gate is at high potential and from any other high potential current source connected to the enable gate side of said coupling means; said coupling means coupled between the enable

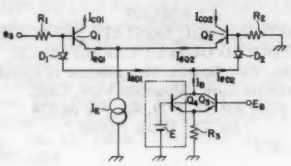
gate and the base of the pulldown element without connection to the base of the phase splitter element or other element of the device and therefore without incapacitating the phase splitter element or diverting current from any other element of the device.

4,311,928

CURRENT-CONTROLLED TYPE DIVISION CIRCUIT

Hitoshi Hirata, and Akira Nishioka, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 12, 1979, Ser. No. 102,812
Claims priority, application Japan, Dec. 14, 1978, 53-174466
Int. Cl.³ G06G *7/16, 7/163*
U.S. Cl. 307—498 **3 Claims**



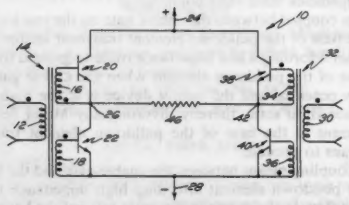
1. In a current-controlled type division circuit of the type including a differential circuit having a first and a second transistors, each having an emitter, a base and a collector and wherein the emitters of said first and said second transistors are commonly connected to each other and a dividend signal is applied between the bases thereof, a constant current source being connected to the commonly connected emitters thereof, a first and a second diodes, each having a first and a second terminals and where the first terminals of said first and second diodes are connected to the bases of said first and said second transistors, respectively, and the second terminals thereof are commonly connected to each other, a third transistor having an emitter, a base and a collector, and the collector of said third transistor being connected to the commonly connected second terminals of said first and said second diodes, said third transistor being operable to control a divisor signal flowing in the collector thereof responsive to a division signal applied to the base thereof, the improvement comprising auxiliary means coupled in parallel to said third transistor for flowing the divisor signal when the division signal applied to the base of said third transistor falls below a predetermined minimum.

4,311,929

SUMMING AMPLIFIER

William L. Konrad, Niantic, and William L. Clay, Stonington, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Arlington, Va.

Filed Dec. 31, 1979, Ser. No. 108,857
Int. Cl.³ H03F *1/26, 3/216;* **H03K** *5/26*
U.S. Cl. 307—529 **4 Claims**



1. A summing amplifier for summing and amplifying at least two input signals at high levels which comprises:

means for coupling said input signals separately to said summing amplifier including a pair of transformers, each of said pair of transformers having the primary coil terminals thereof connected to one of said input signals and wherein the first transformer of said pair of transformers includes first and second secondary coils and the second transformer of said pair of transformers includes third and fourth secondary coils;

a bridge circuit for amplifying and combining said input signals wherein said bridge circuit includes a first pair of NPN transistors each having emitter, collector and base electrodes for amplifying one of said input signals and being connected to said first and second secondary coils of the first of said pair of transformers and a second pair of NPN transistors each having emitter, collector and base electrodes for amplifying the other of said input signals and being connected to said third and fourth secondary coils of the second of said pair of transformers; and

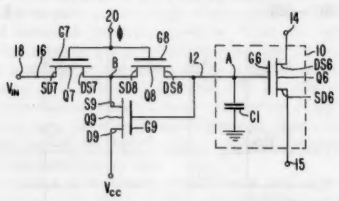
output load means connected to said bridge circuit for obtaining the output of said summing amplifier.

4,311,930

VOLTAGE PROTECTION CIRCUIT FOR BINARY DATA-STORAGE DEVICE

John Y. Chan, Belmont, and John J. Barnes, Fremont, both of Calif., assignors to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Dec. 17, 1979, Ser. No. 104,639
Int. Cl.³ H03K *17/16, 17/687*
U.S. Cl. 307—575 **7 Claims**



1. An electronic circuit for controlling an input data signal on a signal-carrying line conductor to a binary data-storage device having (1) an input line conductor for receiving the input data signal, (2) a capacitance between the input line conductor and a substantially constant voltage reference, and (3) a first transistor having a current-control electrode coupled to the input line conductor, the circuit comprising:

a second transistor having (1) a first current-conducting electrode coupled to the signal-carrying line conductor, (2) a second current-conducting electrode, and (3) a current-control electrode coupled to an input control terminal;

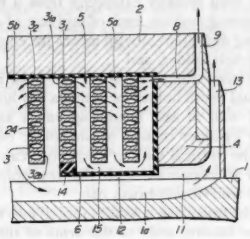
a third transistor having (1) a first current-conducting electrode coupling to the second current-conducting electrode of the second transistor, (2) a second current-conducting electrode coupled to the input line conductor, and (3) a current-control electrode coupled to the input control terminal; and

a fourth transistor having (1) a first current-conducting electrode coupled to the second current-conducting electrode of the second transistor and to the first current-conducting electrode of the third transistor, (2) a second current-conducting electrode coupled to a source of a substantially constant bias voltage, and (3) a current-control electrode coupled to the input line conductor.

4,311,931
ROTOR FOR HYDROGEN-COOLED ROTARY ELECTRIC MACHINES

Kazumasa Fujioka, Ibaraki, and Wataru Nakayama, Kashiwa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 19, 1979, Ser. No. 86,683
Claims priority, application Japan, Oct. 27, 1978, 53-131659
Int. Cl.³ H02K *9/00*
U.S. Cl. 310—55 **4 Claims**

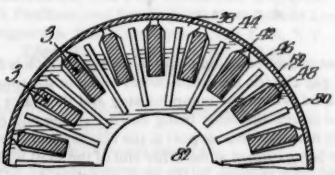


1. A rotor for hydrogen-cooled electric machines comprising:
a rotor shaft;
a plurality of rotor windings disposed about said rotor shaft;
a retaining ring for holding said rotor windings in position on said rotor shaft;
a center ring secured to said retaining ring;
gas inlet and outlet chambers circumferentially defined by said center ring and radially extending partition walls and disposed in a region between said rotor shaft and said retaining ring;
a plurality of fan-like ventilating means disposed on the outer side of the rotor end for discharging outside of the rotor gases which are introduced from said gas inlet chamber through the rotor windings to cool the same and then flow into the gas outlet chamber; wherein the improvement comprises means including L-shaped insulating spacers and circumferentially extending partition walls mounted on the underside of the lowermost winding of selected laminated windings for dividing said gas outlet chamber into first and second zones located near the polar axis of the rotor and a third zone located near the interpolar axis thereof, said plurality of fan-like ventilating means including first fan-like ventilating means disposed on the outer side of said center ring for discharging gases from said first and third zones of said gas outlet chamber and second fan-like ventilating means for discharging gases from said second zone of said gas outlet chamber.

4,311,932
LIQUID COOLING FOR INDUCTION MOTORS

Raymond N. Olson, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 28, 1980, Ser. No. 116,010
Int. Cl.³ H02K *9/00*
U.S. Cl. 310—61 **19 Claims**

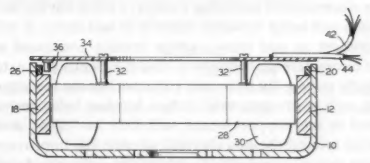


1. A liquid cooled dynamoelectric machine comprising, a housing, a stator in said housing, a rotor within said stator with an air gap therebetween, a series of slots within said rotor and extending axially thereof, said slots opening to the ends of the rotor and having their radial outer ends in noncommunicating relation with said air gap, conductors mounted in said slots and having lesser transverse dimensions than said slots to provide clearance spaces around said conductors which define liquid channels, and means for supplying a cooling liquid to said channels for flow along said channels and intimate and substantially surrounding contact with said conductors.

4,311,933
BRUSHLESS DIRECT CURRENT MOTOR

William D. Riggs, Southington, and Joseph J. Schegan, Wallingford, both of Conn., assignors to North American Philips Corporation, New York, N.Y.

Filed Aug. 27, 1979, Ser. No. 70,069
Int. Cl.³ H02K *21/12*
U.S. Cl. 310—156 **7 Claims**

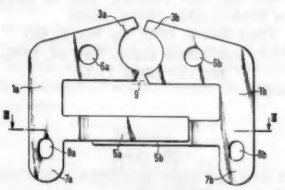


1. A multipole multiphase brushless direct current motor having a rotor which includes a plurality of angularly spaced field magnets and a stator having phase windings and a circuit for switching electric power to said phase windings which comprises a plurality of hall effect switches and a plurality of angularly spaced commutating magnets carried on said rotor.

4,311,934
OFF SET STATOR LAMINATIONS FOR SMALL ROTARY TRANSDUCERS

Hans Flaig, Schramberg, Fed. Rep. of Germany, assignor to Gebruder Junghans GmbH, Schramberg, Fed. Rep. of Germany

Filed Feb. 26, 1980, Ser. No. 124,776
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1979, 2911439
Int. Cl.³ H02K *1/00*
U.S. Cl. 310—216 **4 Claims**



1. In an electromagnetic transducer comprising a rotor, a stator, and at least one excitation coil, the improvement wherein said stator comprises only two individual stator sections which are of identical generally C-shape geometry, each stator section including two arms, a first of which defining a magnetic pole for said rotor and a second of which disposed within said coil, said second arms overlapping one another in the direction of the main axis of said coil and being offset from one another in a direction laterally of said coil axis such that said first arms are also offset from one another in said last-named direction.

4,311,935
COOLING FOR BRUSHES OF ELECTRIC MOTORS

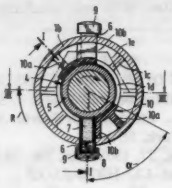
Franz Hoyss, Bad Tölz, Fed. Rep. of Germany, assignor to Palar (Curacao) N.V., Netherlands Antilles

Filed Oct. 22, 1979, Ser. No. 87,306

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1978, 2846069

Int. Cl.³ H01J *17/20*

U.S. Cl. 310—227 **11 Claims**



1. An electromotor including a stator, a rotor having an axis of rotation and being rotatable relative to said stator, a collector positioned on said rotor, carbon brushes positioned adjacent the circumferential periphery of said collector and extending radially outwardly from said collector, means for supporting said carbon brushes, said carbon brushes being movably supported by said support means, said rotor having a direction of rotation around the axis thereof, wherein the improvement comprises that said support means laterally enclose said carbon brushes, said carbon brushes have a first side facing in the direction of rotation of the rotor and a second side facing in the opposite direction, a segment-shaped shell closely covering said support means on the second side of each said carbon brush and extending from the second side of each said carbon brush in the circumferential direction of said collector opposite to the direction of rotation of said collector and closely covering said collector for an angular part of the circumferential periphery thereof extending from the second side of each said carbon brush with an angular part of said collector extending from the first side of said carbon brushes in the direction of rotation of said collector being uncovered for providing sufficient cooling of said collector while affording effective protection of said collector and carbon brushes from contamination by at least limiting the flow of cooling air thereover.

4,311,936
BRUSH HOLDING DEVICE FOR ELECTRIC MOTOR

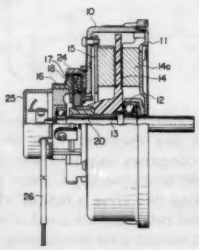
Sozaburo Ozaki, and Isao Tonooka, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 8, 1979, Ser. No. 92,503

Claims priority, application Japan, Nov. 16, 1978, 53-140421

Int. Cl.³ H02K *13/00*

U.S. Cl. 310—242 **5 Claims**



1. A brush holding device the brush holding device comprising:

a brush holder having a flange mounted to a housing of the electric motor;

a brush received in said brush holder;

a coil spring received in said brush holder for forcing said brush into contact with a commutator segment;

a brush cap removable attached to an outer side of said brush holder, the brush cap including a coil retaining portion for bearing an end of said coil spring disposed opposite to said commutator segment, a a pair of elastic arms extending from respective side of the coil retaining portion, and a vertical wall radially extending from a base end of said coil retaining portion, each of said pair of arms are formed at leading ends thereof with means for engaging the flange of the brush holder; and

means for preventing said brush cap from radially slipping out of said brush holder including a key hole formed in the vertical wall of said brush cap and a key formed on a holding cylinder of said brush holder on a side thereof facing the vertical wall of said brush cap, said key being adapted to cooperate with the key hole formed in the vertical wall of said brush cap;

whereby the brush cap is axially forced into the brush holder until the leading ends of the arms of the brush cap are elastically retained by the brush holder so as to enable a mounting of the brush cap to the brush holder, with the arms of the brush cap being pinched inwardly toward each other to release the engaging means of the arm so as to enable the brush cap to be axially removed from the brush holder.

4,311,937
AXIAL GAP ELECTRIC MOTORS

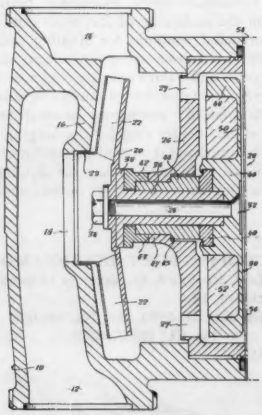
Ronald J. Clark, Sidmouth, England, assignor to Sealed Motor Construction Co. Ltd., Bridgwater, England

Continuation of Ser. No. 598,423, Jul. 23, 1975, abandoned. This application Nov. 25, 1977, Ser. No. 854,644

Claims priority, application United Kingdom, Jul. 25, 1974, 32972/74

Int. Cl.³ H02K *1/22*

U.S. Cl. 310—268 **11 Claims**



1. In an improved liquid pump of the type which is driven by an axial gap electric induction motor wherein the rotor rotates in the liquid within the pump housing and the stator is sealed from the liquid, the rotor being carried at one end of a shaft rotatably mounted to a support in the housing and a centrifugal impeller being carried at the other end of the shaft with the eye of the impeller opening in the axial direction away from the rotor, the housing having a liquid inlet leading to the impeller eye through an opening in an internal wall of the housing and

a liquid outlet from a region of the housing at the periphery of the impeller, the rotor having a highly conductive component in the form of a thin annular web disposed in a plane facing the stator and separated therefrom by a small axial gap and joining axially thicker hub and rim portions so as to define an annular channel around the conductive component, an unenergized ferromagnetic core being disposed opposite the stator to provide a return path for the magnetic flux from the stator; the improvement wherein the whole of the effective unenergized ferromagnetic component is secured to the rotor and occupies said annular channel, and the rotor shaft is journalled to the said support therefor through a ceramic bearing pack, the pack being formed from a first part which is fabricated of a ceramic material and rotates with the shaft and a second part which is fabricated on a ceramic material and is secured to the support, the first part including means providing mutually facing end thrust bearing surfaces and an intermediate external cylindrical bearing surface, and the second part including means providing mutually outwardly facing end thrust bearing surfaces which mate with those of the first part and an intermediate internal cylindrical bearing surface which mates with the external cylindrical bearing surface of the first part.

4,311,938

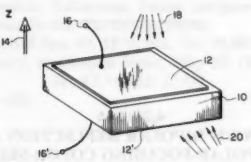
METHOD OF SWEEPING QUARTZ

Arthur Ballato, Long Branch, and John R. Vig, Colts Neck, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 9, 1980, Ser. No. 148,114

Int. Cl.³ H01L *41/08;*

U.S. Cl. 310—311 **17 Claims**



1. In a method of sweeping quartz wherein the quartz is heated to between 300° C. and 573° C. and a strong DC voltage applied for the purpose of transporting the ionized impurities, the improvement of supplying an external source of energy in the form of electromagnetic waves selected from at least one member of the group consisting of electromagnetic waves having wavelengths in the infrared range and electromagnetic waves having wavelengths in the ultraviolet range as to aid, very substantially, the release and transport of impurities, thereby sweeping the quartz to a higher state of purity in a shorter time.

4,311,939

ALKALI ANTIMONIDE LAYER ON A BERYLLIM-COPPER PRIMARY DYNODE

Richard D. Faulkner, and Robert E. McHose, both of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 21, 1980, Ser. No. 132,659

Int. Cl.³ H01J *40/00*

U.S. Cl. 313—95 **11 Claims**

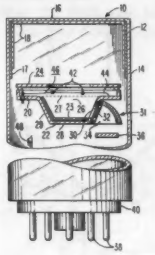
1. An electron discharge tube comprises:

an evacuated envelope;

a photocathode within said envelope;

a primary dynode having an active portion with an oxide secondary emitting surface thereon;

a substantially uniform layer of an alkali antimonide compound formed on substantially all of said oxide secondary emitting surface;



at least one secondary dynode spaced from said primary dynode; and

an anode adjacent to said secondary dynode.

4,311,940

ELECTRIC INCANDESCENT LAMP

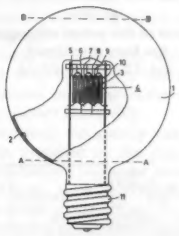
John Fitzgerald, and Willem L. Van Hoorn, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 4, 1980, Ser. No. 118,167

Claims priority, application Netherlands, Mar. 14, 1979, 7902016

Int. Cl.³ H01J *1/88, 19/42;* **H01K** *1/18*

U.S. Cl. 313—273 **2 Claims**



1. An electric incandescent lamp having a substantially spherical lamp envelope whose wall is provided with a light pervious, infrared radiation-reflecting filter and in which a filament is accommodated near the center of the lamp envelope, characterized in that the filament is a flat folded filament of helically wound wire and is situated within a square having a side length between 0.25 and 0.04 times the inner diameter of the lamp envelope.

4,311,941

THERMIONIC CATHODE SUPPORTING DEVICE

Hideo Hiraoka; Masaru Amemiya, and Hirotoshi Hagiwara, all of Machidashi, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1979, Ser. No. 105,488

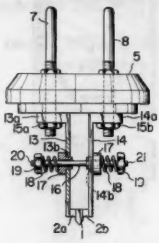
Claims priority, application Japan, Jan. 23, 1979, 54-5581

Int. Cl.³ H01J *1/16*

U.S. Cl. 313—336 **13 Claims**

1. A thermionic cathode supporting device comprising a pair of resilient electroconductive members of plate or rod type for simultaneously holding a thermionic cathode tip and a pair of tip supporting heaters contacted therewith, and a pressing means adapted to impart pressing force to said members from the outside thereof, said pressing means comprising a cylindri-

cal heat resistive and electric insulator means having a flange portion and fitted into said pair of electroconductive members, bolt means passing through an aperture provided in said insulator, said bolt means having a longitudinal axis, a pair of retaining members mounted to the ends of said bolt means, and a pair of annular spring members disposed between said retaining members and said insulator, said annular spring members having longitudinal axis substantially coincident with said axis of said bolt means.



4,311,942

COMPACT FLUORESCENT LAMP AND METHOD AND MEANS FOR MAGNETIC ARC SPREADING

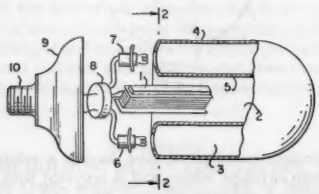
S. Merrill Skeist, Brookville, and Leo Gross, Bayside, both of N.Y., assignors to Spellman High Voltage Electronics Corp., Plainview, N.Y.

Continuation-in-part of Ser. No. 834,651, Sep. 21, 1977, Pat. No. 4,187,446, and a continuation-in-part of Ser. No. 935,481, Aug. 21, 1978, abandoned. This application Jun. 4, 1979, Ser. No. 45,589

The portion of the term of this patent subsequent to Feb. 4, 1997, has been disclaimed.

Int. Cl.³ H05B *41/14*

U.S. Cl. 315—62 **14 Claims**



2. A fluorescent lamp comprising an outer envelope defining a chamber containing electrodes to form an arc discharge, a luminescent phosphor coating all the interior walls of said chamber, ballast and circuitry means in said chamber and operatively connected to said electrodes, and arc spreading coil means for creating a diverging magnetic field at right angles to the direction of said arc discharge and within the path of said arc discharge so that said arc discharge is spread throughout the volume of said chamber.

4,311,943

FLUORESCENT LAMP WITH ARC SPREADING WITH RECOMBINATION STRUCTURES

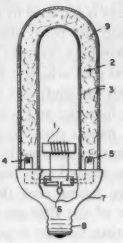
Leo Gross, Bayside, and S. Merrill Skeist, Glenhead, both of N.Y., assignors to Spellman High Voltage Electronics Corp., Plainview, N.Y.

Filed Nov. 13, 1979, Ser. No. 93,052

Int. Cl.³ H01J *7/44, 17/34, 23/16;* H01K *1/62*

U.S. Cl. 315—70 **2 Claims**

1. An arc discharge device such as a fluorescent lamp comprising an outer envelope, said envelope containing arc spreading means including two electrodes to form the arc discharge, and a luminescent phosphor coating all interior walls of said envelope, said arc spreading means further including ballast and circuitry means in said envelope, a screw-in base secured to said envelope and electrically operatively connected to said ballast and circuitry means and said electrodes, recombination structure means in said envelope for electrons and ions to convert more energy into more visible light, said recombination structure means being an insubstantial gossamer of fine fibers of glass or quartz, said envelope being U-shaped and having two legs and an interconnecting portion, said screw-in base being secured to said interconnecting portion, said arc spreading means being disposed between said two legs, said U-shaped envelope having a flattened elliptical, non-circular cross-section.



4,311,944

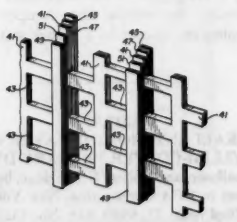
CRT WITH DIPOLAR DEFLECTION AND QUADRUPOLAR-FOCUSING COLOR-SELECTION STRUCTURE

Stanley Bloom, Bridgewater, and Carmen A. Catanese, Rocky Hill, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 27, 1980, Ser. No. 163,724

Int. Cl.³ H01J *29/80*

U.S. Cl. 315—375 **10 Claims**



1. In a cathode-ray tube including

(a) a target comprising an array of substantially parallel phosphor stripes of three different emission colors arranged in cyclic order in adjacent triads, each triad comprising a stripe of each of said three different emission colors,

(b) means for producing three convergent in-line electron beams directed towards said target in a plane that is substantially normal to the lengths of said stripes and

(c) a color-selection structure positioned between said target and said beam-producing means, said structure comprising (i) a metal masking plate having two opposed major surfaces and having therein an array of apertures arranged in columns that are substantially parallel to said phosphor stripes, and (ii) a first array of narrow conductors insulatingly supported from one major surface of said plate and extending substantially parallel to the lengths of said stripes, with a conductor being supported on said plate in every other space between said columns, said masking plate and said conductors defining an array of windows for transmitting therethrough portions of said electron beams,

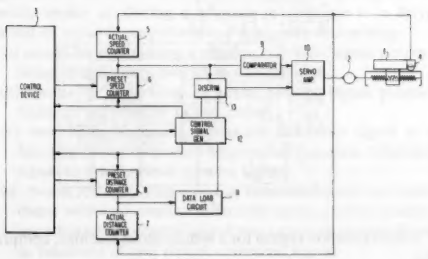
the improvement comprising (iii) a second array of narrow conductors insulatingly supported from the other major surface of said plate, each conductor of said second array being opposite and spaced from a conductor of said first array.

4,311,945

DECELERATION METHOD OF DRIVING SOURCE IN LOCATION CONTROL

Tadamasa Aoyama, Yokohama, Japan, assignor to Kabushiki Kaisha Senesu Shoko, Yokohama, Japan

Filed Sep. 10, 1979, Ser. No. 74,007
Claims priority, application Japan, May 25, 1979, 54/64001
Int. Cl.³ G05B *13/00*
U.S. Cl. 318—561 **6 Claims**



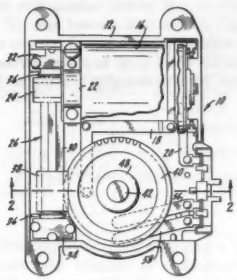
1. In a method of controlling the stepwise deceleration of a machine tool through a plurality of deceleration stages in which a signal representative of the velocity of the tool is derived from a pulse signal representative of the travel of the tool, the improvement comprising the application of the control signal for each deceleration stage at a time predetermined as a function of the strain occuring in the machine tool as a result of the control signal in the immediately preceding deceleration stage.

4,311,946

ACTUATOR WITH ELECTRIC FEEDBACK SIGNAL

Charles E. Pathmann, Goodview, Minn., assignor to Lake Center Industries, Winona, Minn.

Filed Mar. 21, 1979, Ser. No. 22,426
Int. Cl.³ G05B *1/06*
U.S. Cl. 318—663 **4 Claims**



1. In an actuator of the type having a housing, an electric motor mounted in the housing, power and ground leads providing a circuit for supplying electric power to the motor, an output shaft, gear means in driving relation with the motor for driving the output shaft, the improvement comprising a position feedback-signal generating means including:

a feedback-signal lead;

a source lead adapted to be connected to a voltage source for the feedback-signal;

a cam plate mounted for movement with the output shaft;

a first contactor strip made of a continuous, electrically conductive material, mounted on the cam plate, with the source lead in contact therewith;

a second contactor strip, electrically insulated from the first contactor strip, mounted on the cam plate and having intermittent conductive segments interspersed in a non-conductive portion, with the feedback-signal lead in contact therewith;

bridge leads, including resistance means, connecting the conductive segments of the second contactor strip to the first contactor strip so that when a conductive segment is contacted by the feedback-signal lead a feedback-signal is generated.

4,311,947

Patent Not Issued For This Number

4,311,948

DYNAMIC BRAKING OF A.C. MOTORS

Joseph E. Brown, Newcastle-upon-Tyne; Charles R. Gamble, Shepshed, both of England, and Frank Norman, St. Catherines, Canada, assignors to National Research Development Corporation, London, England

Filed Apr. 2, 1979, Ser. No. 26,236
Int. Cl.³ H02P *3/18, 7/04*
U.S. Cl. 318—759 **56 Claims**

1. Control apparatus for the dynamic braking of an induction motor having primary windings of polyphase form and a plurality of pairs of terminals associated therewith, comprising:

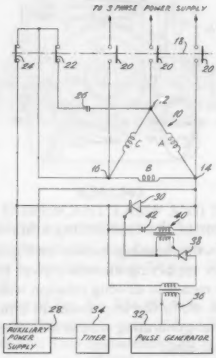
a capacitor;

switching means operative subsequent to the disconnection of said motor from a power supply for connecting said

capacitor across a first pair of terminals of said primary windings to establish self-excitation in said primary windings; and

control means operative after a predetermined delay from the connection of said capacitor during which initial braking occurs, for obtaining a respective low impedance path across at least a second pair of terminals of said primary windings other than said terminals across which said capacitor is connected following the occurrence of a selected phase reference condition in a self-excitation wave form of said motor, conduction in the low impedance path across said second pair of terminals being initiated within a predetermined portion of a cycle of said self-excitation wave form to obtain further braking.

53. A method for dynamically braking an induction motor



having primary windings of polyphase form and a plurality of terminals associated therewith, comprising the steps of:

removing power from said motor;

establishing self-excitation in said primary windings by connecting a capacitor across a series arrangement of a first predetermined one and a second predetermined one of said primary windings, said primary windings being connected in quadrature for connection to a single-phase supply, for obtaining initial braking of said motor; and

enabling a low impedance path across a preselected one of said primary windings, subsequent to a predetermined delay period during which initial braking of said motor occurs, at a predetermined phase angle of a self-excitation wave form of said motor conduction thereby being able to occur through the low impedance path across said first primary winding to obtain further braking of said motor.

4,311,949

SEMICONDUCTOR CIRCUIT FOR SPEED CONTROL OF ELECTRIC MOTORS

Bernhard Pelkmann, Haar; Dieter Vogel, Eglharting, both of Fed. Rep. of Germany, and Alfred Schenkl, Johnson City, Tenn., assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 3, 1979, Ser. No. 54,584

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1978, 2830212

Int. Cl.³ H02P *5/16*

U.S. Cl. 318—799 **10 Claims**

1. A speed control circuit for controlling the speed of an a.c. electric motor which is connected to a supply voltage and has a drive shaft and drives a tachometer, comprising:

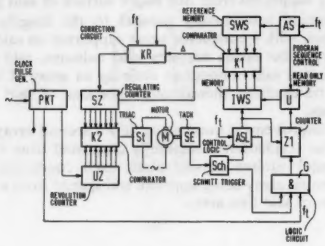
a firing angle control circuit connecting the motor to the supply voltage;

analog/digital converter means including a Schmitt trigger circuit connected to and operated by the tachometer to produce pulses representing actual speed;

first memory means connected to said analog/digital converter means for storing a digital actual speed signal in response to said pulses;

second memory means for storing a digital reference speed signal;

comparison means connected to said first and second memory means for producing an error signal in response to and in accordance with the difference between the digital actual and reference signals;



digital correction means connected to said comparison means and to said firing angle control circuit for producing a firing angle control signal in accordance with the error signal; and

clock means connnected to the supply voltage and to said analog/digital converter means and to said correction means and operable to produce clock pulses to synchronize the operation of said control circuit.

4,311,950

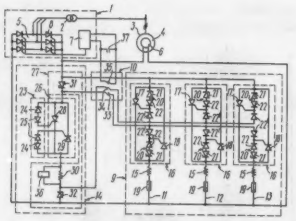
EXCITATION SYSTEM FOR A SYNCHRONOUS MACHINE

Rodion G. Goldin, ulitsa Mamina-Sibiryaka, 8, kv. 56; Vladimir Y. Tukhman, ulitsa Agronomicheskaya, 16, kv. 23, and Valentin G. Yakimenko, ulitsa Taganskaya, 48, kv. 89, all of Sverdlovsk, U.S.S.R.

Filed Mar. 28, 1980, Ser. No. 134,870

Int. Cl.³ H02P *1/46, 5/28*

U.S. Cl. 318—718 **2 Claims**



1. An excitation system for a synchronous machine, comprising:

an exciter having an output connected to a field winding of said synchronous machine;

a starting-protecting unit connected in parallel to said output of said exciter, said starting-protecting unit having parallel branches,each branch containing a series-connected resistor and thyristor switch having a voltage-sensitive threshold element connected between its anode and gate;

a current relay of the starting-protecting unit electrically coupled to said exciter and having contacts; and

a turn-on unit for said parallel branches of said starting-protecting unit comprising an overvoltage detector with a voltage setting below that of said threshold element of said thyristor switch of said starting-protecting unit, a memory unit and a pulse-forming unit, said overvoltage

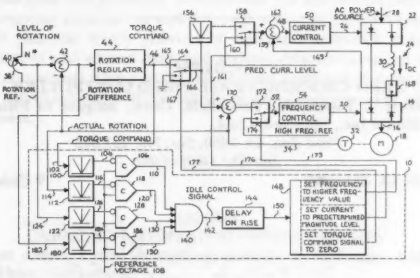
detector having an output coupled through said memory unit to an input of said pulse-forming unit, said overvoltage detector being connected in parallel with said output of said exciter, and said pulse-forming unit having an output coupled through said contacts of said current relay to said gates of said thyristor switches in the parallel branches of said starting-protecting unit.

4,311,951

APPARATUS AND METHOD FOR HIGH SLIP OPERATION OF AN AC ELECTRIC MOTOR AT SUBSTANTIALLY ZERO ROTATION AND SUBSTANTIALLY ZERO TORQUE

Loren H. Walker, Salem, and John H. Cutler, Roanoke, both of Va., assignors to General Electric Company, Salem, Va.

Filed Apr. 24, 1979, Ser. No. 32,899
Int. Cl.³ H02P 1/26
U.S. Cl. 318—778 **29 Claims**



1. A substantially zero rotation and substantially zero torque apparatus for an AC electric motor drive system having an AC electric motor producing a rotation in response to a drive current of variable magnitude and frequency comprising:

(a) means for establishing a rotation reference signal proportional to a desired level of motor rotation;

(b) means for generating an actual rotation signal proportional to the rotation of the motor;

(c) means for generating a rotation difference signal as a function of any difference between said rotation reference signal and said actual rotation signal;

(d) means for supplying a torque command signal in accordance with said rotation difference signal, and for producing a frequency control signal and a current control signal as functions of said torque command signal;

(e) means for supplying drive current to the motor at a frequency controlled in response to said frequency control signal and at a magnitude varied in accordance with said current control signal;

(f) means for furnishing an idle control signal when said torque command signal and at least two of said rotation reference signal, said actual rotation signal, and said rotation difference signal are less than respective predetermined values; and

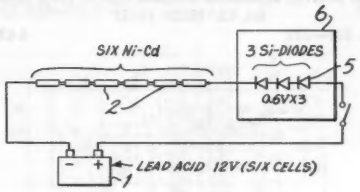
(g) first and second modifying means each responsive to said idle control signal for, respectively, changing the magnitude and rapidly raising the frequency of the drive current to cause the motor to produce a substantially zero rotation and substantially zero torque at high slip.

4,311,952

BATTERY CHARGING SYSTEM

Kenichi Mabuchi, and Kogiro Komatsu, both of Tokyo, Japan, assignors to Mabuchi Motor Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 518,469, Oct. 29, 1974, abandoned. This application Mar. 22, 1976, Ser. No. 669,240
Claims priority, application Japan, Nov. 2, 1973, 48-123866
Int. Cl.³ H02J 7/10
U.S. Cl. 320—3 **7 Claims**



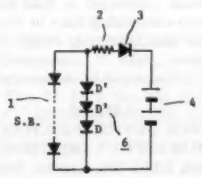
1. A battery charging system for charging a Ni-Cd battery having a predetermined number of individual Ni-Cd cells comprising, a lead acid power supply battery having an identical predetermined number of individual lead-acid cells, whose battery terminal voltage is higher than the charging completion voltage of the Ni-Cd battery to be charged, and non-linear resistance elements only connected in series between said power supply battery and the battery to be charged, the total threshold voltage of said elements being approximately equal to the voltage difference between the terminal voltage of the power supply battery and the charging completion voltage of the battery to be charged; wherein the batteries to be charged are charged from the power supply battery via the non-linear resistance element to provide a constant-voltage charge across the batteries without overheating or overcharging.

4,311,953

CHARGER USING ONE OR MORE SOLAR BATTERIES

Hiroaki Fukuda, Nara; Takehiko Sasaki, Yamatokoriyama, and Hiroshi Mori, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 825,478, Aug. 17, 1977. This application Oct. 22, 1979, Ser. No. 86,793
Claims priority, application Japan, Aug. 17, 1976, 51-98422; Jul. 22, 1977, 52-88612
Int. Cl.³ H02J 7/00; G04C 3/00
U.S. Cl. 320—2 **11 Claims**



1. A charging circuit including a solar battery and a silver oxide secondary battery, said charging circuit delivering a charging voltage and a charging current to said silver oxide secondary battery, comprising:

voltage limiting means shunting said solar battery for limiting said charging voltage across said secondary battery to a predetermined value, said voltage limiting means including a PN junction diode means in series with a light-emitting diode means; and

current limiting means in series with the combination of said solar battery and said voltage limiting means shunting said

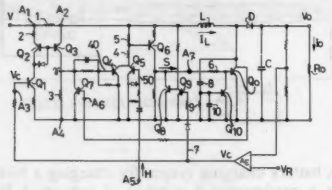
solar battery for limiting said charging current through said secondary battery.

4,311,954

ELECTRIC MODULATOR APPARATUS WITH SYNCHRONIZED CONDUCTANCE CONTROL MODE

Antoine Capel, Ramonville, France, assignor to Organisation Europeenne de Recherches Spatiales, Paris, France

Filed Mar. 31, 1980, Ser. No. 135,724
Claims priority, application Belgium, Apr. 9, 1979, 194484
Int. Cl.³ H02P *13/32*
U.S. Cl. 323—222 **4 Claims**



1. In an apparatus for regulating an electric circuit parameter which is related to an electric current feeding a regulation unit including a regulating switch arranged for being switched between a first non-conducting logic state and a second conducting logic state in response to a drive signal, an electric modulator operating in synchronized conductance control mode and comprising:

current sensor means connected to sense said electric current and to generate a sensing signal representing said current;

current reference signal generator means connected to be responsive to a command signal for generating a current reference signal the amplitude of which is a function of said command signal;

comparator means connected to compare said current sensing signal to said current reference signal for producing a control voltage related to the current difference;

a switching device connected to produce said drive signal for the regulating switch, said switching device comprising first switch means connected to accept clock pulses and transfer same as a drive signal for switching said regulating switch from its first logic state to its second logic state, and second switch means connected to accept said control voltage and transfer same for holding said regulating switch in its second logic state after a clock pulse is applied, and

third switch means connected to hold said second switch means in a non-conducting state in response to a signal indicating that said regulating switch is reset to its first logic state.

4,311,955

PHASE CONTROL DEVICE WHICH COMPENSATES FOR INPUT VARIATIONS

Naoyuki Murakami, 2-12-2-704, Kyuden, Setagaya-Ku, Tokyo-To, Japan

Filed Dec. 10, 1979, Ser. No. 101,830
Claims priority, application Japan, Dec. 14, 1978, 53-153700
Int. Cl.³ G05F *5/00, 1/455*
U.S. Cl. 323—300 **5 Claims**

1. A phase control device, comprising:

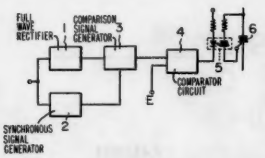
(a) an a.c. power source;

(b) a full wave rectifying circuit connected to said a.c. power source and for rectifying an input a.c. voltage from said a.c. power source;

(c) a synchronous signal generating circuit also connected to said a.c. power source and for generating a synchronous signal based on the input a.c. voltage;

(d) a comparison signal generating circuit connected to said full wave rectifying circuit and said synchronous signal generating circuit and for generating a comparison signal for every half a.c. wave upon its receipt of said synchronous signal;

(e) a power source different from said input a.c. power source for producing a preset phase control angle signal;



(f) a comparison circuit for directly comparing said comparison signal from said comparison signal generating circuit with said preset phase control angle signal from said different power source, and for obtaining a control signal for the phase control; and

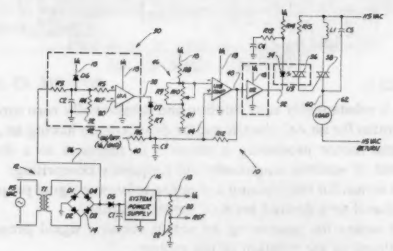
(g) at least one phase control element connected with said comparison circuit, and rendered conductive by an output from said comparison circuit.

4,311,956

ZERO CROSSING PHASE FIRED CONTROLLER

Robert J. Tolmie, Jr., Brookfield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jun. 19, 1980, Ser. No. 161,095
Int. Cl.³ G05F *5/00*
U.S. Cl. 323—300 **9 Claims**



1. A phase fired control circuit for eliminating large shifts in the firing angle, comprising: a power supply operational to provide a fixed voltage and a reference voltage, a clamping and zero crossing detector circuit, means for supplying d.c. to said clamping and detector circuit, a capacitor operative to be charged by said fixed voltage, said capacitor being charged when said detector circuit outputs a first voltage and discharged when said detector circuit outputs a second voltage, a variable voltage circuit, said variable voltage circuit receiving said fixed voltage, a comparator connected to receive the output from said capacitor when said capacitor is discharged and the output from said variable voltage circuit, said comparator being operative to compare said outputs and send a high signal when the magnitude of said capacitor output is higher than the output from said variable voltage circuit, and an inverting driver operative to receive the signal from said comparator, a gate coupled to said comparator to be driven thereby, a source of power controlled by said gate and a load in electrical connection with said source of power to be driven thereby when said gate is enabled.

4,311,957

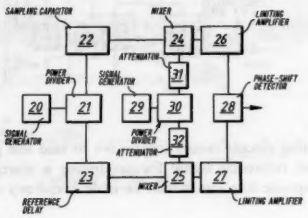
MEASUREMENT OF MOISTURE CONTENT

Sidney J. Hewitt, West Wellow; Juan M. Ozamiz, Romsey, and Albert E. Yallup, Totton, all of England, assignors to British-American Tobacco Company Limited, London, England

Filed Mar. 31, 1980, Ser. No. 135,292

Int. Cl.[3] G01R *27/04*

U.S. Cl. 324—58.5 R 9 Claims



1. Apparatus for the continuous measurement of the moisture content of a loose fibrous, filamentary or particulate material, comprising a microwave signal generator, first and second signal paths, a signal divider operable to divide a microwave signal from said generator between said first and second paths, a sampling capacitor in said first path arranged to receive the said material which provides a dielectric, reference delay means in said second path, and a phase detector arranged to receive signals from said first and second paths and to provide an output indicative of the waveform time displacement of said signals.

4,311,958

CAPACITIVE THREAD STOPPING MOTION

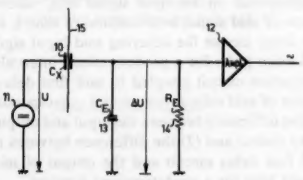
Kurt Aeppli, Uster, Switzerland, assignor to Zellweger, Ltd., Uster, Switzerland

Filed Jan. 6, 1978, Ser. No. 867,488

Claims priority, application Switzerland, Jan. 10, 1977, 1606/77

Int. Cl.[3] G01R *27/26;* B65H *63/06;* G01L *5/04*

U.S. Cl. 324—61 R 5 Claims



1. A capacitive thread stopping and motion detecting device which is arranged definitely to display the presence of a running thread by emitting a relevant signal in such a way that the signal fails immediately when the running thread is absent, comprising a direct current source, an amplifier having a high input resistance, and a precision capacitor through which a thread to be monitored can run to form a portion of the dielectric of the capacitor, the precision capacitor being connected to said direct voltage source for producing an electric field between the plates thereof and to the input of said amplifier which produces an alternating current output in response to variations in the capacitance of said capacitor resulting from the running of the thread therethrough.

4,311,959

CAPACITIVE MEASURING SENSOR

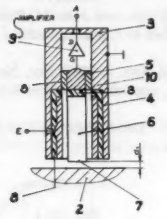
Eberhard Riessland, Dr.-Karl-Rüdrich-Strasse 34, DDR-801 Dresden; Wolfgang Wagner, Wittenberger Strasse 33, DDR-8019 Dresden, and Günter Opitz, Hölderlinstrasse 9, DDR-8122 Radebeul, all of German Democratic Rep.

Filed Jun. 14, 1979, Ser. No. 48,354

Claims priority, application German Democratic Rep., Jun. 20, 1978, 206138

Int. Cl.[3] G01R *27/26*

U.S. Cl. 324—61 P 7 Claims



1. A capacitance sensor for measuring capacitance between itself and a conductive material and thereby measuring a distance therebetween, comprising:

a coupling pin with a measuring surface at a lower end thereof;

a first electrode surrounding a part of the coupling pin and being spaced therefrom;

a second electrode located above and adjacent to the coupling pin and being spaced therefrom;

an amplifier with an input connected to the second electrode;

a hollow and grounded shield with an open bottom and a closed top, the shield containing the first and second electrodes and a part of the coupling pin in a manner that the first electrode is flush with the bottom of the shield and the measuring surfaces of the coupling pin is adjacent said bottom;

a first dielectric layer separating the first electrode from the shield;

a second dielectric layer separating the second electrode from the shield;

an input line connected only to the first electrode; and

an output line connected only to an output of the amplifier.

4,311,960

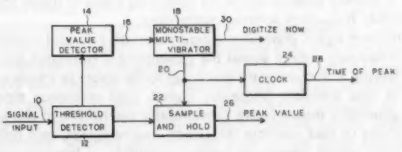
TRANSIENT SIGNAL PROCESSING CIRCUIT

Frank P. Barr, Albuquerque, N. Mex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 21, 1979, Ser. No. 106,300

Int. Cl.[3] G01R *19/04;* H03K *5/153*

U.S. Cl. 324—103 P 5 Claims



1. A transient signal processing circuit for analyzing a signal input, comprising:

a threshold detector for selecting from said signal input a signal portion having at least a minimum amplitude;

a peak value detector connected to said threshold detector

for providing an output when said signal portion reaches a maximum amplitude;

a sample and hold circuit for holding the value of said signal input upon receiving said output and thereby recording the value of said maximum amplitude; and

a clock for receiving said output to indicate the time at which said maximum amplitude was attained.

4,311,961

TESTING OF ENCLOSED ELECTROMAGNETIC RELAYS

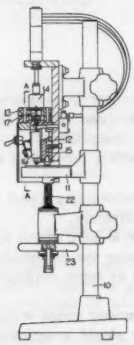
William D. Holt, Colne, and John M. Robinson, Nelson, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Nov. 5, 1979, Ser. No. 91,505

Claims priority, application United Kingdom, Nov. 25, 1978, 46081/78

Int. Cl.³ G01R *31/02*

U.S. Cl. 324—418 **8 Claims**



1. A method of testing an enclosed electromagnetic relay comprising the steps of inserting a measuring probe through an opening in the relay enclosure into engagement with a movable contact of the relay, displacing said probe so as to move the movable contact and measuring the force exerted by the probe to break electrical contact between said movable contact and a first fixed contact of the relay and the distance moved by the probe between such breaking of electrical contact and the making of electrical contact between the movable contact and a second fixed contact of the relay.

4,311,962

VARIABLE FREQUENCY MISSING PULSE DETECTOR

Jerry M. Titsworth, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

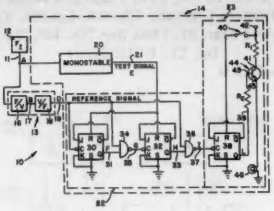
Filed Sep. 4, 1979, Ser. No. 72,388

Int. Cl.³ H03K *5/19*

U.S. Cl. 328—120 **9 Claims**

1. A missing pulse detector for detecting a loss of signal from a variable frequency source, comprising:

reference signal generator means responsive to said variable frequency source signal for generating a reference signal having a frequency proportional to the average frequency of said variable frequency signal, said reference signal generator means being substantially insensitive to the lost cycle of said variable frequency source signal, said reference signal generator means including a frequency-to-voltage converter and a voltage-to-frequency converter connected in series, one of said converters receiving said source signal, said reference signal being an output of the other of said converter means for generating non-delayed test pulses in response to cycles of said variable frequency source signal and with a repetition rate substantially equivalent to the frequency of the variable frequency source signal; and



warning circuit means responsive to said test pulses and to said reference signal for producing a warning signal in response to a loss of said variable frequency source signal.

4,311,963

NOISE PULSE SUPPRESSING SYSTEM

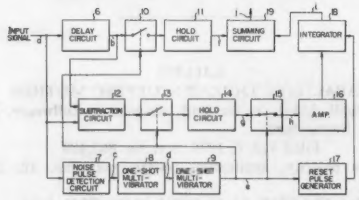
Masahiro Watanabe, Sagamihara, and Hiroshi Horikawa, Kamakura, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 9, 1979, Ser. No. 56,002

Claims priority, application Japan, Jul. 18, 1978, 53-88189; Aug. 31, 1978, 53-107124

Int. Cl.³ H04B *1/10*

U.S. Cl. 328—163 **3 Claims**



1. A noise pulse suppression system for suppressing a noise pulse superposed on an input signal S(t), where S(t) is the magnitude of said signal as a function of time t, comprising

a first delay circuit for delaying said input signal including said noise pulse for a predetermined interval;

a subtraction circuit coupled to said first delay circuit, the output of said subtraction circuit corresponding to one of (1) the difference between the input and output of said first delay circuit and (2) the difference between the output of said first delay circuit and the output of said first delay circuit held for a predetermined interval;

a first signal holding means coupled to the output of said first delay circuit, said first signal holding means holding for a predetermined interval the level of said input signal existing at a time immediately preceding the appearance of said noise pulse;

a second signal holding means coupled to the output of said subtraction circuit, said second signal holding means holding the output of said subtraction circuit for a predetermined interval;

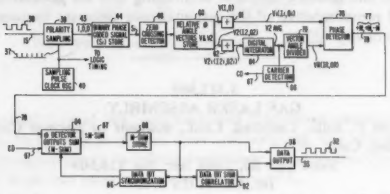
correction means coupled to the output of said second signal holding means for generating a correction signal; and

a summing circuit for adding said correction signal to the output of said first signal holding means, the output of said summing circuit corresponding substantially to said input signal with said noise pulse suppressed.

4,311,964
COHERENT PHASE SHIFT KEYED DEMODULATOR FOR POWER LINE COMMUNICATION SYSTEMS

John R. Boykin, Arnold, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 21, 1979, Ser. No. 77,824
Int. Cl.[3] H03D 3/00; H04L 27/22
U.S. Cl. 329—104 24 Claims



1. A demodulator for data bit signals modulating rectangular pulse signals derived from a binary phase shift keyed carrier, comprising:

means sampling said rectangular pulses and producing polarity sample bits having either of two binary logic states corresponding to first and second levels of said rectangular pulse signals with predetermined equal groups of said sample bits cyclically occurring during each data bit interval;

means responsive to said predetermined equal groups of the sample bits for producing first vector component signals having a relative phase angle representation at a fundamental frequency for each separate one of said predetermined equal groups of the sample bits;

means responsive to a plurality of said predetermined groups of the sample bits for producing reference vector component signals having a relative phase angle representation at said fundamental frequency;

phase detector means producing correlation signals in response to phase comparisons of each of said first vector component signals and said reference vector component signals; and

means selectively summing said correlation signals when produced in response to phase comparisons of said first vector component signals produced from said separate ones of said predetermined equal groups of the sample bits occurring during the same data bit intervals.

4,311,965
MODULAR AMPLIFIER WITH DISCRETE POWER REDUCTION SWITCHING

William E. Jones, Kings Park, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

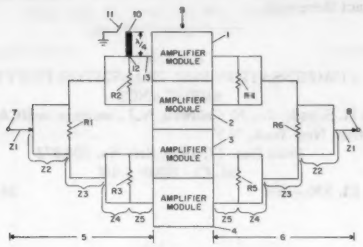
Filed Apr. 14, 1980, Ser. No. 140,062
Int. Cl.[3] H03F 3/68
U.S. Cl. 330—124 R 6 Claims

1. An amplifier system comprising:

(a) amplifier means including a plurality of modules each having an input and an output;

(b) power divider means having a power input for receiving a signal to be amplified and a plurality of outputs each connected to a corresponding module input;

(c) power combiner means having a power output for providing the amplified signal and having a plurality of inputs each connected to a corresponding module output; and

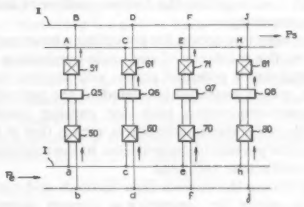


(d) power reflection means connected to at least one predetermined power divider output for selectively reflecting a short circuit.

4,311,966
DISTRIBUTED AMPLIFIER FOR MICROWAVE FREQUENCIES

Alain Bert; Didier Kaminsky, and Gerard Kantorowicz, all of Paris, France, assignors to Thomson CSF, Paris, France

Filed Dec. 5, 1979, Ser. No. 100,481
Claims priority, application France, Dec. 5, 1978, 78 34224
Int. Cl.[3] H03F 3/60
U.S. Cl. 330—286 2 Claims



1. A distributed amplifier for microwave frequencies comprising two input and output transmission lines, that is an input line connected to an hyperfrequency power source, and an output line connected to a load, and a plurality of active quadripoles mounted in shunt with two poles connected to the input line and the two other poles connected to the output line, and means for matching said quadripoles with each transmission line, said matching means being constituted by portions of the lines themselves, and the impedances at the terminals of said transmission lines, opposite the source and the load, respectively consisting of the input impedance and the output impedance of the farthest among the quadripoles of said plurality, wherein the active quadripoles consist of field-effect transistors formed in side-by-side relation in a zone of one of the faces of a semi-insulating substrate, wherein the transmission lines are constituted by conductive deposits formed on said face and on the oppositely-facing portions of a conductive electrode which covers the opposite face of said substrate, wherein the input line comprises aligned conductive deposits connected to the transistor gates and the output line comprises further aligned conductive deposits on the other side of said zone and connected to the transistor drains, wherein the reactances are inductance elements consisting of conductive strips directed at right angles to said aligned deposits and in contact with said deposits at one end thereof, said strips being interconnected at the other end by means of a conductor deposited on the substrate which extends in a direction parallel to said aligned deposits, and wherein the coupling elements consist of capacti-

tors placed between the inductance elements and formed by the superposed ends of two consecutive deposits, said ends being separated by a layer of insulating material placed in contact therewith.

4,311,967

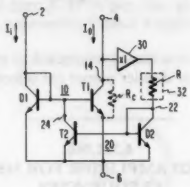
COMPENSATION FOR TRANSISTOR OUTPUT RESISTANCE

Otto H. Schade, Jr., N. Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 17, 1979, Ser. No. 104,372

Int. Cl.³ H03F *3/04*

U.S. Cl. 330—288 **24 Claims**



1. In combination:

an amplifier transistor having a current flow in a main-conduction path between output and common electrodes thereof, said current flow having a portion responsive to a control signal applied between control and common electrodes thereof, and having a further portion responsive to the resistance of said main-conduction path, and

means for counteracting the further portion of said current flow comprising:

current conductive means for providing a resistance proportional to the resistance of said main-conduction path;

means applying a potential across said current conductive means, which potential is related to the potential across said main-conduction path for causing current flow through said current conductive means that is related to the further portion of current flow in the resistance of said main-conduction path; and

means receiving the current flow through said current conductive means for supplying a current proportionally related thereto to the control electrode of said amplifier transistor.

4,311,968

MAGNETRON HAVING CAVITY WALL VIBRATED BY TUNING FORK

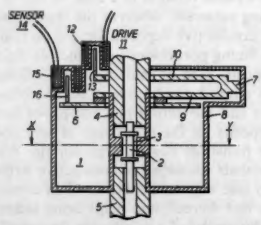
Alan H. Pickering, and Geoffrey J. Rowlands, both of Chelmsford, England, assignors to English Electric Valve Company Limited, Chelmsford, England

Filed Dec. 4, 1979, Ser. No. 100,003

Claims priority, application United Kingdom, Dec. 5, 1978, 47235/78; Nov. 19, 1979, 39909/79

Int. Cl.³ H01J *23/20, 25/50*

U.S. Cl. 331—90 **10 Claims**



10. A magnetron including movable conductive means which is movable relative to an annular resonant cavity for determining the frequency of oscillation of a microwave output signal, and characterized by a mechanical resonator in the form of a tuning fork which is located within a vacuum enclosure containing the magnetron anode and said annular resonant cavity, and wherein one arm of said tuning fork is rigidly connected to said movable conductive means so as to vibrate it and thereby to cyclically alter the resonant frequency of the cavity, and means coupled to said tuning fork for generating a signal representative of the instantaneous resonant frequency of the cavity.

4,311,969

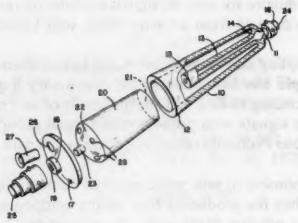
GAS LASER ASSEMBLY

William P. Kolb, Carlsbad, Calif., assignor to Zoomar Corp., Irvine, Calif.

Filed Jan. 23, 1980, Ser. No. 114,608

Int. Cl.³ H01S *3/03*

U.S. Cl. 331—94.5 D **9 Claims**



1. A gas laser assembly including, in combination:

(a) means for providing a closed volume having anode and cathode end portions;

(b) an elongated capillary discharge tube in said volume having a first end positioned at said anode end portion of said volume and an extending second end terminating in an opening short of the far end of the cathode end portion of said volume;

(c) an anode electrode secured to said anode end portion of said volume in communication with said first end of said capillary discharge tube;

(d) an end plate for closing off the cathode end portion of said closed volume; and,

(e) a cathode having a first end surrounding at least a portion of said extending second end of said capillary discharge tube and having a shaped structure closing off a major portion of its second end, said second end being secured to and supported by said end plate, the second open end of said capillary discharge tube being axially spaced from the interior of said shaped structure of the cathode by a given distance at least as great as the radial distance between said open end and the inner wall of said cathode to thereby protect said end plate from discharge action at said second end of said capillary tube and provide for a uniform current density on the interior surface of said shaped structure of said cathode.

4,311,970

MICROWAVE, SOLID-STATE, STABILIZED OSCILLATOR MEANS

Alain Bert, and Bernard Le Clerc, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 10, 1979, Ser. No. 73,854

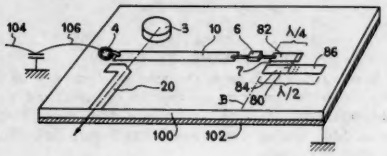
Claims priority, application France, Sep. 15, 1978, 78 26553

Int. Cl.³ H03B *5/12*

U.S. Cl. 331—107 R **3 Claims**

1. A microwave solid state oscillator comprising a negative resistance diode and associated with the latter means for pro-

ducing radioelectric oscillations within the diode, means for coupling the diode to one end of a supply line, a cavity resonator coupled to said line and resonating on a frequency f_o, a useful load and a damping load and a stop-band filter being

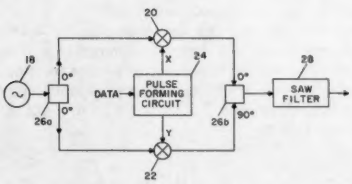


connected to said line, said loads and filter being mounted in series on the line as viewed from said coupling, and said filter being equivalent to an infinite impedance at f_o frequency and a very weak one outside a given band round f_o.

4,311,971
APPARATUS FOR GENERATING CONSTANT-ENVELOPE, ANGLE-MODULATED PULSE SIGNALS

Richard LaRosa, South Hempstead, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Filed Sep. 19, 1979, Ser. No. 76,712
Int. Cl.³ H03C 3/40; H03K 7/06
U.S. Cl. 332—9 R **9 Claims**



1. Apparatus for generating a constant-envelope, angle-modulated pulse signal, comprising:

a first bi-phase modulator, for amplitude modulating a carrier with a first supplied pulse signal;

a second bi-phase modulator, for amplitude modulating a carrier with a second supplied pulse signal;

means for supplying a carrier to said first and second modulators;

means for combining the amplitude modulated carriers from said first and second modulators in a selected phase relation;

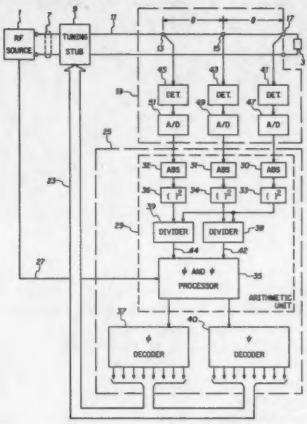
a surface acoustic wave filter, responsive to said combined modulated carriers for generating said constant-envelope, angle-modulated pulse signal;

and means, responsive to a supplied information bearing input signal, for generating said first and second pulse signals, said second pulse signal having pulses interleaved with the pulses of said first pulse signal, the pulses of said first and second pulse signals being representative of said information and said pulses having pulse spacing and pulse duration selected to cause pulse overlap by an amount suitable to generate a constant-envelope, angle-modulated pulse signal at the output of said filter.

4,311,972
HIGH SPEED ANTENNA COUPLER

Harvey L. Landt, and Donald J. Mooty, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 21, 1980, Ser. No. 113,982
Int. Cl.³ H03H 7/40
U.S. Cl. 333—17 M **6 Claims**



1. A high speed coupler for tuning a transmission line between a radio frequency source having an output impedance Z_0 and a radio frequency load, comprising:

means for measuring the power transfer U_1 between a point located a distance θ, where θ is the distance in wavelength of the transmitted frequency, from the RF load;

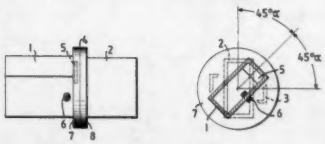
means for measuring the power transfer U_2 between a point located a distance of 2 θ from the RF load; and

means for inserting a tuning stub having a length Ψ and located a distance ϕ from the RF load wherein Ψ and Φ are indicated by U_1, U_2, θ and Z_0.

4,311,973
WAVEGUIDE JUNCTION

Erich Nuding, Auenwald, and Gerhard Hirsch, Backnang, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 2, 1978, Ser. No. 957,005
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1977, 27489561
Int. Cl.³ H01P 1/165
U.S. Cl. 333—33 **6 Claims**



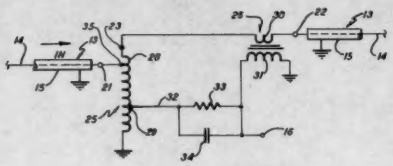
1. A junction for connecting together two waveguides whose major transverse axes are inclined to one another, comprising: means connecting the frontal faces of said waveguides in such a manner that their major axes are adjustably inclined to one another; two flat flanges each connected to a respective waveguide and having flat faces coextensive over their entire extent with a common connecting plane at which said faces directly abut and which cover the nonoverlapping frontal faces of said two waveguides; and inductive and capacitive

reactance means disposed at the point of discontinuity produced by the angular offset between said waveguides for compensating for such discontinuity over a broad frequency band.

4,311,974
WIDE BAND DIRECTIONAL COUPLER

Prabhakara Reddy, Fayetteville, N.Y., assignor to Eagle Comtronics, Inc., Clay, N.Y.

Filed Jun. 9, 1980, Ser. No. 158,066
Int. Cl.³ H03H 7/52
U.S. Cl. 333—112 **10 Claims**



7. A directional coupler for insertion into a line for transmitting wide band signals that has a center conductor and a grounded outer conductor comprising:

an input terminal and an output terminal for connecting said coupler in series with the center conductor for the transmission line;

an output tap point;

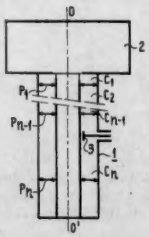
a first transformer having an input winding, an intermediate tap connected to said input terminal which divides said input winding into a first section of N_1 turns and a second section of N_2 turns, said second section being connected to said outer conductor, and an output means connected to said output tap point for supplying output signals corresponding to signals passing through said first transformer input winding to said output tap point; and,

a second transformer having an input winding connected in series between the first section of said first transformer input winding and said output terminal for raising the impedance at the input to said second transformer to a level greater than the characteristic impedance of the transmission line, and an output means connected to said output tap point for supplying output signals corresponding to signals passing through said second transformer input winding to said output tap point.

4,311,975
FREQUENCY BAND FILTER

Michel Benoit; Pierre Gerlach; Claude Grolleau, and Alain Lartillot, all of Paris, France, assignors to Thomson CSF, Paris, France

Filed Dec. 18, 1979, Ser. No. 104,913
Claims priority, application France, Dec. 22, 1978, 78 36248
Int. Cl.³ H01P 1/205, 7/04
U.S. Cl. 333—207 **7 Claims**

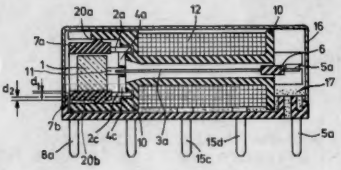


1. A band pass filter, wherein it has a single coaxial line, separated into a plurality of elementary resonator cavities by pistons, which determine the voltage nodes of the standing wave system established in the line, said pistons ensuring the coupling between two successive resonator cavities and the frequency tuning of the elementary cavities, their position on the line being regulatable.

4,311,976
POLARIZED REED RELAY

Hans Sauer, Fichtenstrasse 5, Deisenhofen, Fed. Rep. of Germany (D-8024); Humihiro Kasano, Shijonawate, and Yoichi Isobe, Tsu, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan and Hans Sauer, Deisenhofen, Fed. Rep. of Germany

Filed Mar. 31, 1980, Ser. No. 135,532
Claims priority, application Japan, Mar. 30, 1979, 54-38816; Jun. 15, 1979, 54-75787
Int. Cl.³ H01H 51/22
U.S. Cl. 335—78 **17 Claims**



1. A polarized reed relay comprising

(a) a bobbin having at least one coil wound thereon,

(b) two ferromagnetic contact reeds extending substantially along the coil axis through an interior passage provided in the bobbin, each reed being fixed at one of its ends to the bobbin,

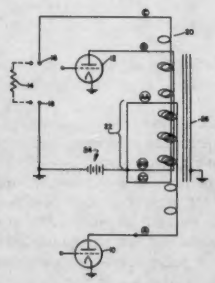
(c) at least one permanent magnet, and

(d) two pairs of pole shoes positioned in the bobbin, each pole shoe having a first portion disposed in proximity to a pole of the magnet and a second portion forming a fixed contact, each pair of fixed contacts cooperating with the free end of one of the reeds to form a double-throw contact system.

4,311,977
OUTPUT TRANSFORMER

Kenneth Owen, Dallas, Tex., assignor to Continental Electronics Mfg. Co., Dallas, Tex.

Filed May 29, 1980, Ser. No. 154,207
Int. Cl.³ H01F 15/14, 27/28
U.S. Cl. 336—69 **12 Claims**



1. An output transformer of the type for use in audio power amplification, comprising:

first and second input windings of substantially equal inductance and being arranged contiguously with the same winding sense for a portion but not all of their total winding length;

such that one end of said first input winding is physically offset from the corresponding end of said second input winding;

an output winding having the same winding sense as said first and second input windings and being arranged contiguously over the entire length of and extending beyond only one end of only one of said first and second input windings; and

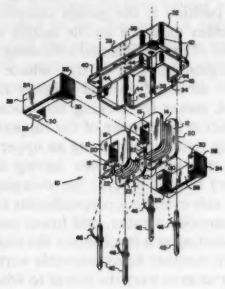
said windings all being arranged on a common core.

4,311,978

U-CORE PULSE TRANSFORMER

Charles R. Crockett, Arlington, and Jerry W. Swafford, Dallas, both of Tex., assignors to Teccor Electronics, Inc., Irving, Tex.

Filed Jun. 1, 1979, Ser. No. 44,475
Int. Cl.³ H01F *27/04*
U.S. Cl. 336—92 **8 Claims**



1. A pulse transformer comprising:

first and second bobbins carrying primary and secondary windings respectively,

first and second U-shaped ferrite cores, each having two arms connected by a bight portion,

the arms of said first and second cores carried within central apertures through said bobbins with each arm being in physical contact with a corresponding arm of the opposite core and the bight portions of said cores being adjacent ends of said bobbins,

wherein said bobbins and ferrite cores are carried within a one-piece molded plastic housing having an internal cavity conforming substantially to the outer dimensions of the assembly comprising said first and second bobbins and said first and second cores, said housing being open on one side to allow insertion of said assembly, and

four pins carried on the outer surface of said plastic housing with one each of said pins connected to ends of said primary and secondary windings.

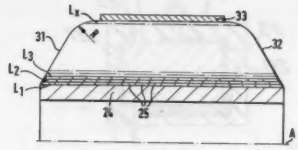
4,311,979

LAYERED TRANSFORMER WINDING

Otto Graul, Bamberg, Fed. Rep. of Germany, assignor to Messwandler-Bau GmbH, Bamberg, Fed. Rep. of Germany

Filed Jul. 13, 1979, Ser. No. 57,283
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1978, 2830757
Int. Cl.³ H01F *27/28*
U.S. Cl. 336—205 **9 Claims**

1. A transformer winding comprising a plurality of winding layers made with a striplike conductor insulated with at least one strip of insulation folded about the conductor in the course of the layered winding of the conductor, said at least one strip of insulation having a width of about three times the width of said conductor and extending around the conductor in at least one layer, said strip insulation not only serving to insulate said conductor but also forming the insulation between adjacent layers of winding without insertion of layer insulations, adjacent winding layers of said winding being affixed to one another at punctate bonding places spaced at predetermined



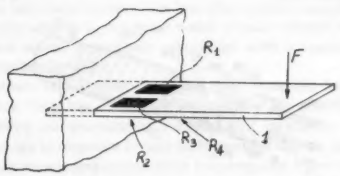
distances by means of a plurality of bonding points of adhesive which are applied along the periphery of a winding layer only on the outside of the conductor insulation and which serve for a fixation of the next succeeding winding layer, and the winding layers being so shortened that the winding is essentially trapezoidal in cross section with the transition to the free outer end of the winding being formed with at least one circular arc, whereby said transformer winding can be produced by a fully automatic, program-controlled winding technique.

4,311,980

DEVICE FOR PRESSURE MEASUREMENT USING A RESISTOR STRAIN GAUGE

Maria Prudenziati, Modena, Italy, assignor to Fabrica Italiana Magneti Marelli, S.p.A., Milan, Italy

Filed Sep. 21, 1979, Ser. No. 77,541
Claims priority, application Italy, Oct. 12, 1978, 28682 A/78; Jan. 12, 1979, 19236 A/79
Int. Cl.³ G01L *1/22*
U.S. Cl. 338—4 **8 Claims**



1. In a device for pressure measurement of the type comprising a deformable substrate subjected to a pressure to be measured, a strain gauge disposed on said substrate, and electric circuit means connected with said strain gauge for sensing changes in the electrical resistance of said strain gauge as a function of the substrate formation, wherein said strain gauge is comprised of at least one thick film resistor having a strain gauge factor of at least 10 deposited on said substrate.

4,311,981

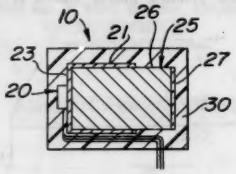
MAGNETIC SWITCH

Anthony J. Luzynski, 3526 Sheffield Ave., Philadelphia, Pa. 19136

Filed Nov. 17, 1980, Ser. No. 207,414
Int. Cl.³ H01L *43/04, 43/06*
U.S. Cl. 338—32 H **7 Claims**

1. A magnetically activated Hall Effect switch of enhanced magnetic sensitivity comprising a Hall Effect digital sensor, a fixed magnet proximate to on side of said sensor, shielding means shielding said fixed magnet from said sensor to prevent activation of the latter by said fixed magnet only, said shielding

means being configured to shield said fixed magnet between the latter and said sensor and leave unshielded a region of said fixed magnet spaced from said sensor, and an operating magnet movable toward and away from the other side of said sensor with opposite poles of said fixed and operating magnets adja-



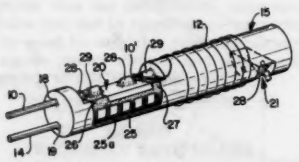
cent to each other to activate the sensor, said operating magnet cooperating with said fixed magnet and shielding means to increase the magnetic field through said sensor for activation thereof with said operating magnet at a greater distance from said sensor than possible without said fixed magnet.

4,311,982

TRIMMABLE WIREWOUND RESISTANCE TEMPERATURE TRANSDUCER

Harry L. Trietley, Jr., Yellow Springs, Ohio, assignor to The Yellow Springs Instrument Company, Inc., Yellow Springs, Ohio

Filed Aug. 1, 1980, Ser. No. 174,409
Int. Cl.³ H01C *10/00*
U.S. Cl. 338—195 **4 Claims**



1. A precision resistance element comprising a generally cylindrical ceramic mandrel,

means in said mandrel defining a pair of spaced transversely extending slots separated by an intermediate portion,

a pair of leads extending axially through said mandrel with one of said leads in intersecting relation with one of said slots,

a platinum wire wound on said intermediate portion having one end thereof connected to one of said leads at one of said slots,

a platinum film deposited on a surface of said mandrel having portions thereof extending into the other of said slots,

means connecting one of said film portions to the other of said leads and another of said film portions to the other end of said wire whereby said film is connected in series with said wire with said leads,

said film further having an intermediate trimmable portion on an exposed surface of said mandrel exteriorly of said other slot by means of which the overall resistance of said element may be adjusted, and

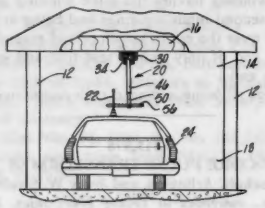
sleeve means extended over said wire protecting said wire against damage.

4,311,983

VEHICLE PARKING SIGNAL DEVICE

Bert W. Piper, 36051 Goddard Rd., Romulus, Mich. 48174

Filed Oct. 29, 1979, Ser. No. 88,829
Int. Cl.³ G08B *3/02*
U.S. Cl. 340—51 **2 Claims**



1. In combination with a vehicle and a vehicle enclosure, such as a garage, having a ceiling structure, an alarm for signalling to the vehicle operator when the vehicle has advanced to a desired parking position in the garage comprising, an elongated support member mounted on the ceiling structure at a level above the roof of the vehicle and extending in a direction parallel to the longitudinal axis of the vehicle in said park position, a bracket mounted on said support for movement lengthwise thereof, means for locking the bracket in a fixed predetermined position lengthwise of the support, a generally vertically extending switch arm having an upper member and a lower member, said upper member having its upper end pivotally connected to said bracket for swinging movement about a horizontal axis extending perpendicular to the longitudinal axis of said support member, said lower member having its lower end terminating at a level above the roof of the vehicle, said lower arm member being movable vertically on the upper arm member so as to vary the extent to which the lower end of the arm projects downwardly from said pivot axis, means for locking said arms together in a predetermined fixedly extended position, a generally horizontally extending cross arm mounted on the lower end of the lower switch arm member, said cross arm being spaced above the roof of the vehicle when in said park position, said cross arm projecting transversely of the longitudinal axis of the vehicle from opposite sides of the switch arm, a vertically extending antenna mounted on the vehicle in a predetermined position and projecting upwardly above the roof of the vehicle, the upper end of said antenna lying in a plane above said cross arm and offset laterally from said switch arm when the vehicle is in said park position, said support member being mounted on said ceiling structure and said bracket being mounted on said support member in such positions in relation to said antenna so that one end portion of the cross arm lies in the path of travel of and is engaged by said antenna to tilt said switch arm forwardly when the vehicle is advanced to said part position and an alarm responsive to said forward tilting movement of said switch arm for signalling to the vehicle operator that the vehicle has advanced to said desired park position.

4,311,984

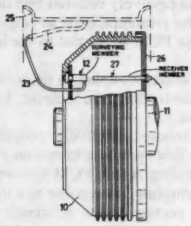
DEVICE FOR THE CHECKING OF THE PRESSURE OF TIRES OF A MOTOR VEHICLE

Elio Rigazio, Via Tripoli 66, Vercelli; Galileo Rossi, Via Jacopo Palma 26, Milan, and Piero Salussolia, Via Castello 6, Massazza, all of Italy

Filed Dec. 4, 1979, Ser. No. 100,250
Claims priority, application Italy, Dec. 4, 1978, 30519 A/78
Int. Cl.³ B60C *23/02*
U.S. Cl. 340—58 **3 Claims**

1. A device for signalling the pressure in a tire fitted to a wheel of a vehicle, which device comprises a surveying member constituted by a cylinder in which there slides in sealing

relationship a piston with a magnetic core in antagonism to a spring, to form a chamber in communication with the tire, the said surveying member being mounted axially on the rotating bearing of the wheel to find itself axially aligned with a sensor member fixed to a fixed part of the vehicle, the said sensor member comprising a couple of magnetic switches normally



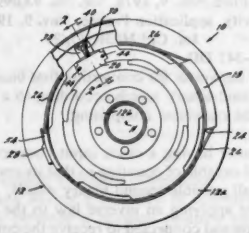
open and supported in mutual angular position and between which there is arranged a secondary magnet keeping the said switches closed, the magnetic core having a direction of magnetization opposed to the direction of magnetization of the secondary magnet, the proximity of these magnets causing the opening of the magnetic switches, an electric circuit being piloted by the opening of the switches to emit a signal.

4,311,985

TIRE PRESSURE MONITOR AND DEENERGIZATION CIRCUIT THEREFORE

Thomas A. Gee, Allen Park, and Donald Speranza, Canton, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 15, 1980, Ser. No. 112,367
Int. Cl.³ B60C 23/04
U.S. Cl. 340—58 **17 Claims**



1. An improved tire pressure monitoring system of the type including a wheel mounted, battery powered transmitter operative to monitor fluid pressure within a pneumatic tire and generate tire inflation condition signals when said pressure falls witnin a predetermined operating range indicative of normal tire inflation, and a receiver operative to receive said signals and to generate an operator alerting signal in the absence of said signals, said improvement comprising:

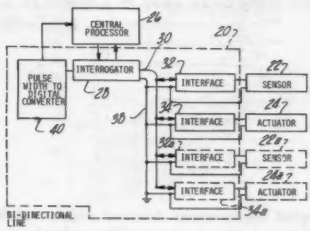
means independent of said fluid pressure and operative to deenergize said transmitter as a function of the operating condition of an associated vehicle.

4,311,986

SINGLE LINE MULTIPLEXING SYSTEM FOR SENSORS AND ACTUATORS

Henry C. Yee, Royal Oak, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 13, 1978, Ser. No. 942,003
Int. Cl.³ H04Q 9/00
U.S. Cl. 340—825.63 **33 Claims**



1. A system for transmitting signals between a processor and at least one remotely located device, wherein the processor generates a plurality of command signals uniquely identifying each of the remotely located device, comprising:

a bi-directional data transmission line;

interrogation signal generating means interconnecting the processor with said data transmission line for generating on said data transmission line interrogation signals having pulse widths t_i, the pulse width of each of said interrogation signal is uniquely associated with a corresponding command signal;

interface means interconnecting each remotely located device with the data transmission line for selectively enabling communication between the processor and said device in response to said interrogation signals, each interface means responsive to an interrogation signal including one of said predetermined pulse widths which is different from the predetermined pulse width to which other interface means respond;

wherein each of said interface means includes:

a pulse width discriminator for generating a trigger signal in response to an interrogation signal having a predetermined pulse width; means responsive to said trigger signal for establishing direct communication between the device and said transmission line, and

wherein the predetermined pulse width of said interrogation signal has a time duration t_1, said pulse width discriminator comprises:

first means responsive to the beginning of each interrogation signal appearing on said transmission line, for generating a first test pulse of duration $(t_i - \Delta)$;

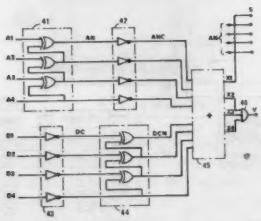
second means, responsive to the termination of said first test pulse for generating a second test pulse having a duration 2Δ where 2Δ corresponds to a time increment smaller than t_1; and

third means, responsive to said interrogation signals and said second test pulse, for generating a trigger signal indicative of the condition that said interrogation signal of duration t_i has terminated during the time of said second test pulse.

4,311,987
VALIDITY CHECK PROCESS FOR DATA SUPPLIED BY DIGITAL DISPLACEMENT DETECTORS AND DETECTORS USING THIS PROCESS

Jacques A. J. Taillebois, Plaisir, France, assignor to M.C.B., Courbevoie, France

Filed Jun. 5, 1978, Ser. No. 912,183
Claims priority, application France, Jun. 14, 1977, 77 18200
Int. Cl.³ G08C *9/00*
U.S. Cl. 340—347 P **12 Claims**

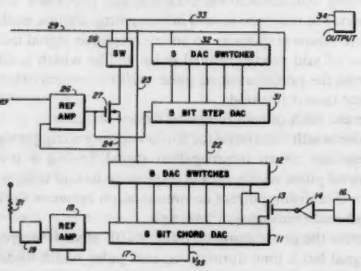


1. A digital displacement detector with a validity check system, the detector having a movable member bearing a set of coded tracks, a first reading device registering with at least one track of said set of tracks and arranged to provide a first word of digital information in a reflected code identifying the position of the movable member relative to the reading device, a second reading device arranged to provide a second word of digital positional information having the same number of bits as the first word and corresponding to a position spaced along the tracks from the position indicated by the first word by a predetermined amount which is a non-integral number of lowest order digital divisions along the tracks, and a checking circuit for checking that the two words have a numerical difference corresponding to said predetermined amount of spacing.

4,311,988
PROGRAMMABLE A-LAW AND μ-LAW DAC

Stephen H. Kelley, Tempe, Ariz., and Richard W. Ulmer, Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Apr. 5, 1979, Ser. No. 27,421
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 DA **3 Claims**



1. An MOS companded digital to analog converter for converting a digital PCM word to an analog signal, comprising:

a chord DAC for providing, in response to a chord portion of the PCM word, an output current to an intermediate node and a reference current to a reference node, comprising:

a first ordered plurality of current sources, each of the first current sources providing a current twice as large as the next lower of the first current sources; and

a first ordered plurality of switches, the highest ordered of which selectively couples the highest ordered of the first current sources to a dump node in response to the chord portion of the PCM word and to the reference node otherwise, the lowest ordered of which selectively couples the lowest ordered of the first current sources to the reference node in response to the chord portion of the PCM word and to an intermediate node otherwise, and the balance of which selectively couple a respective successively ordered one of the first current sources to the reference node in response to the chord portion of the PCM word and to the intermediate node otherwise;

a first reference source coupled to each of the first current sources, for controlling the current levels of the first current sources;

a code current source selectively coupled to the lowest ordered of the first switches, in response to a code enable signal for providing A-law PCM conversion;

a step DAC for coupling, in response to a step portion of said PCM word, a portion of the reference current from the reference node to an output node, and the balance of the reference current from the reference node to the dump node, comprising:

a second, ordered plurality of current sources, each of the second current sources providing a current twice as large as the next lower of the second current sources, the highest ordered of which is coupled to the intermediate node, the lowest ordered of which is coupled between the reference node and the dump node, and the balance of which are coupled to the reference node; and

a second, ordered plurality of switches, the highest ordered of which couples the highest ordered of the second current sources to the output node in response to an enable signal and to the dump node otherwise, and the balance of which selectively couple a respective one of the second current sources to the output node in response to the step portion of the PCM word and to the dump node otherwise; and

a second reference source coupled to the intermediate node and to each of the second current sources, for controlling the voltage potential of the intermediate node.

4,311,989
BINARY CONVERTER IN PARTICULAR FOR TRANSMITTERS AND RECEIVERS OF REDUCED REDUNDANCY IMAGE DATA

Evelyne Roux, Paris, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Nov. 9, 1979, Ser. No. 93,099
Claims priority, application France, Nov. 9, 1978, 78 31684
Int. Cl.³ H03K *13/24*
U.S. Cl. 340—347 DD **9 Claims**

1. A binary converter for converting first binary words into respective second binary words according to a defined transcoding law, the converter comprising:

a fast clock;

a main counter having a clock input connected to the fast clock and capable of counting so that its count state passes through all possible second binary words;

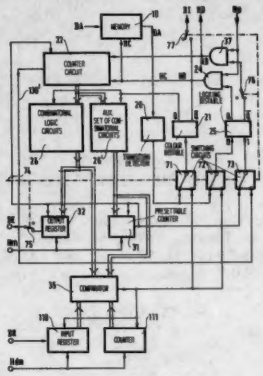
a transcoder applying an inverse law to the defined transcoding law and connected to receive the count state of the main counter to deliver said first words successively in response to the main counter counting through said second words;

a comparator connected to receive both said first words to be converted and said first words delivered successively by the transcoder to detect identity between simultaneously compared words; wherein the state of said main counter at the moment when identity is detected by the comparator being the second word which corresponds to said first word to be converted;

said code converter for coding strings of same level bits into code words encoded according to a truncated Huffman code, the lengths of the strings in binary code as deter-

mined by a string length counter constituting said first words for application to said comparator and the code words constituting said second words, said code converter further including

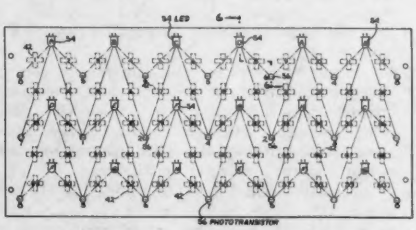
an auxiliary transcoder (226') for transcoding the length of each first word to be encoded into the length of the corresponding second word, said auxiliary transcoder having inputs directly connected to said string length counter (222) and having outputs directly connected to said transcoder (241) to enable those of its inputs which are connected to said main counter (244) that correspond to the length of the required second word.



4,311,990
PHOTO-OPTICAL KEYBOARDS

Greg M. Burke, Walnut, Calif., assignor to Optical Techniques International, Inc., Torrance, Calif.

Filed Nov. 16, 1978, Ser. No. 961,111
Int. Cl.[3] G06F *3/02;* H01H *9/16*
U.S. Cl. 340—365 P 32 Claims



1. A photo-optical keyboard comprising:

keying means having a plurality of individual keys, each moveable between a released position and a depressed position and having a means for yieldably encouraging each said key to said released position;

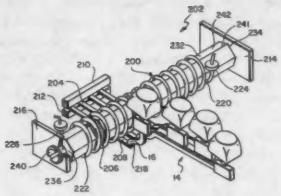
a plurality of light sources, said plurality of light sources being less in number than said plurality of individual keys;

a plurality of light sensors, said plurality of light sensors being less in number than said plurality of individual keys, at least some of said light sources being disposed to direct different portions of the light therefrom toward different ones of said light sensors, said last named light sources and light sensors being positioned with respect to specific ones of said keys so that for each key of said last named keys, that said key and only that said key may substantially block light between a specific one of said light sources and a specific one of said light sensors when in one of said released and depressed positions and not substantially block light when in the other of said released and depressed positions, whereby the depression of any of said last named keys may be detected by the turning on of the associated one of said light sources and the detecting of the state of the said light sensors associated therewith.

4,311,991
ACOUSTIC TRANSMISSION MEMBER

Roger J. Rimbey, Spencer, N.Y., assignor to SCM Corporation, New York, N.Y.

Filed Feb. 13, 1980, Ser. No. 118,058
Int. Cl.[3] G06F *3/02;* H04L *15/03;* H01P *9/02*
U.S. Cl. 340—365 R 9 Claims



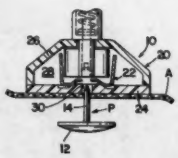
1. An acoustic transmission member for use in an encoding system of the acoustic type, said system having a plurality of acoustic energy inducing devices arranged in a side by side relationship along said member for inducing acoustic energy at a selected position along said member, the induced acoustic energy in the form of sound waves having propagating wave fronts traveling in diverging directions within said member, spaced apart transducer means operatively connected to said member for sensing and converting the received wave fronts into output signals having an elapsed time therebetween as determined by the difference in distance each wave front travels, the improvement comprising:

said member being formed to have a path length between adjacent inducing devices greater than the shortest linear distance between said adjacent inducing device for increasing the elapsed time between said adjacent inducing devices.

4,311,992
REUSABLE RELEASABLE FASTENER

Donald W. DeChant, North Olmsted, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 2, 1979, Ser. No. 53,889
Int. Cl.[3] A44B *21/00;* G08B *13/24, 21/00*
U.S. Cl. 340—572 17 Claims



12. A monitor actuating device attachment system comprising:

a pin member having a headed portion and a shaft, the free end of the shaft portion being pointed for piercing a monitored article:

a monitor actuating device comprising an encapsulated monitor actuating means;

a releasable, reusable, tamper-resistant fastener for releasable attachment to the free end of said pin member shaft, said

fastener formed integrally with said monitor actuating device, said fastener comprising;

a generally hollow body formed integrally with said monitor actuating device and comprising a bottom portion and a generally dome-shaped portion, said bottom portion having a generally centrally located aperture therethrough of greater cross sectional dimension than the cross sectional dimension of said shaft, said dome-shaped portion having an elongated slot therein, said slot having a central portion aligned with said aperture; and

a one-piece spring clip substantially nonrotationally retained in said body, said clip of a generally U-shaped cross section taken on a plane generally perpendicular to the longitudinal axis of said slot and defined by a base portion and two leg portions extending upwardly and inwardly from opposite ends of said base portion, a pair of oppositely extending cantilevered spring fingers cut from said base portion and defining a pair of spaced apart opposed edges separated by a space aligned with said aperture, the portions of said edges defining said space separated by a distance less than the cross sectional dimension of said shaft in the nondeformed position of said clip, said clip being resiliently deformable by separation of said legs to cause said portions of said edges defining said space to be separated by a distance greater than the cross sectional dimension of said shaft; and

a specialized tool designed to release said shaft from said fastener, said tool comprising a handle portion, a shank portion and a tool head portion, said shank portion of lesser cross sectional dimension than said central portion of said slot, said tool head portion being in the shape of a generally rectangular plate having a thickness slightly less than the width of said slot, a length slightly less than the length of said slot, and a height less than the distance between said dome-shaped portion and said base portion, separation of said leg portions by a distance generally equal to the length of said tool head portion being sufficient to cause said portions of edges defining said space to be separated by a distance greater than the cross sectional dimension of said shaft.

4,311,993
MULTISEGMENT LIQUID CRYSTAL INDICATION SYSTEM

Felix Strobel, Greifensee, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland

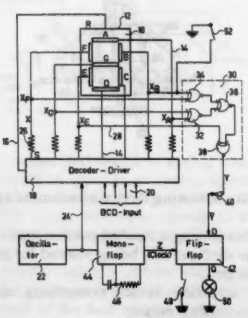
PCT No. PCT/CH79/00036, § 371 Date Feb. 9, 1980, § 102(e) Date Dec. 21, 1979, PCT Pub. No. WO80/00038, PCT Pub. Date Jan. 10, 1980

PCT Filed Mar. 7, 1979, Ser. No. 193,408

Claims priority, application Switzerland, Jun. 9, 1978, 6301/78

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—641 **8 Claims**



1. In a multi-segment liquid crystal display system including a plurality of liquid crystal segments mounted on a common return electrode, and means for selectively activating said segments to display different visual images:

the improvement which comprises

circuit means for selectively inspecting the capacitance properties of at least some of the segments, respectively, thereby to determine the operability of the indication system.

4,311,994
SIGNAL LEVEL INDICATION WITH DIFFERENT COLORS

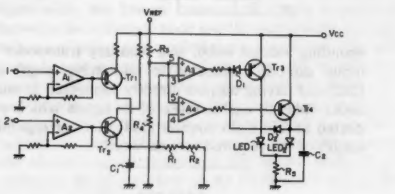
Yasuji Kuribayashi, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Mar. 13, 1979, Ser. No. 20,033

Claims priority, application Japan, Mar. 14, 1978, 53/32246[U]

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—661 **20 Claims**



1. A signal level indicator comprising:

means responsive to the level of an input signal applied thereto for generating a first output signal when the input signal is above a first reference level and generating a second output signal when the input signal is above a second reference level greater than the first reference level;

a first light emissive element for emitting light of a first color;

a first transistor having a control electrode connected to be responsive to said first output signal and first and second controlled electrodes, said first light emissive element being connected to a voltage source through said first and second controlled electrodes of said transistor to emit said light in response to said first output signal;

a second light emissive element for emitting light of a second color;

a second transistor having a control electrode responsive to said second output signal, said second transistor having first and second controlled electrodes, said second light emissive element being connected to said voltage source through said first and second controlled electrodes of said second transistor for emission of said light in response to said second output signal;

means coupled between the first controlled electrode of said second transistor to the control electrode of said first transistor for rendering said first transistor nonconductive in response to the conduction of said second transistor;

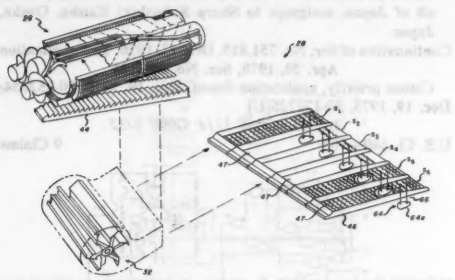
a capacitor connected between the first controlled electrode of said second transistor and ground; and

a current limiting resistor connected in series with the controlled electrodes of the first and second transistors for providing a substantially constant current to said first and second transistors, said capacitor being connected in parallel with said current limiting resistor.

4,311,995
SIEVE OVERLOAD SENSOR FOR ALERTING THE OPERATOR OF A COMBINE OF A SIEVE OVERLOAD CONDITION

George R. Kinzie, Acton, Mass., assignor to Sperry Corporation, New York, N.Y.

Continuation of Ser. No. 884,098, Mar. 6, 1978. This application Nov. 23, 1979, Ser. No. 97,181
Int. Cl.[3] G08B *21/00*; A01D *45/18*
U.S. Cl. 340—684 5 Claims



1. In a combine harvester having grain cleaning means which includes fan means for providing an airflow and sieve means which is separated into a plurality of cooperating longitudinal sections, an apparatus for detecting a blockage of said sieve means comprising:

(a) a plurality of wind sensors responsive to the airflow through the cooperating longitudinal sections of said sieve means;

(b) at least one wind sensor not responsive to the airflow through the cooperating longitudinal sections of said sieve means;

(c) means for balancing output signals from said plurality of wind sensors;

(d) means for biasing the balanced output signals from said plurality of wind sensors with an output signal from said wind sensor not responsive to the airflow through the cooperating longitudinal sections of said sieve means;

(e) means for establishing a threshold signal for said sieve means which is a function of the biased output signals from said plurality of wind sensors;

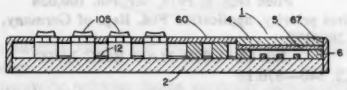
(f) detector means for comparing said biased output signals from said plurality of wind sensors to said threshold signal; and

(g) warning means responsive to said detector means for alerting the operator to a blockage developing anywhere on said sieve means.

4,311,996
HAND HELD TYPE ELECTRONIC CALCULATORS

Tadashi Nakamura, and Kentaro Kiyozumi, both of Ise, Japan, assignors to Ise Electronics Corporation, Ise, Japan

Continuation-in-part of Ser. No. 386,772, Aug. 8, 1973, abandoned. This application Feb. 26, 1976, Ser. No. 661,641
Claims priority, application Japan, Aug. 10, 1972, 47-93856
Int. Cl.[3] G08B *5/36*
U.S. Cl. 340—711 5 Claims

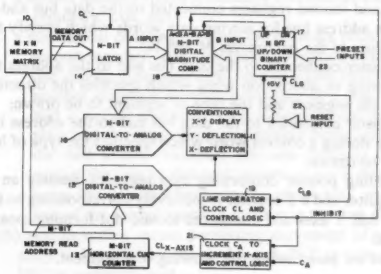


1. A unitary type electronic calculator comprising a multi-digit display section and a key board mounted on one surface of an insulative substrate, a driving circuit for said display section and an operation circuit operated by said key board mounted on said surface of said insulative substrate and printed wire means on only said one surface of said substrate for operatively interconnecting the elements mounted on said surface to operate as a calculator having a physical thickness no greater than the combined thickness of said substrate and the thickest one of said elements.

4,311,997
APPARATUS FOR CONNECTING DATA POINTS ON A CATHODE RAY TUBE DISPLAY AND METHOD THEREFOR

Asad M. Madni, Los Angeles, Calif., assignor to Systron Donner Corporation, Concord, Calif.

Filed Oct. 27, 1978, Ser. No. 955,367
Int. Cl.[3] G06F *3/14*
U.S. Cl. 340—722 4 Claims

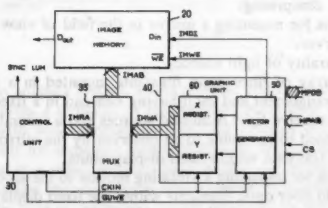


1. A method of connecting data points on an X-Y type cathode ray tube display comprising the following steps: scanning horizontally on said display a predetermined number of discrete addresses; digitally storing said data points each corresponding to a vertical axis display displacement and each data point corresponding to one of said horizontal addresses; determining the vertical axis displacement between a data point being displayed at one address and the next data point to be displayed at another address; inhibiting said horizontal scan for a time proportional to said vertical axis displacement; and concurrently during said inhibiting time causing the display of an effective vertical line between said data points at one horizontal address.

4,311,998
VECTOR GENERATOR FOR A GRAPHIC CONSOLE

Philippe Matherat, Paris, France, assignor to Thomson-CSF, Paris, France

Filed May 16, 1979, Ser. No. 39,259
Claims priority, application France, May 18, 1978, 78 14766
Int. Cl.[3] G06F *3/14*
U.S. Cl. 340—731 7 Claims



1. A digital generator for digitally drawing dotted oriented

line segment of predetermined length on a set of continuous grid points, the elements of said line segment, in digital form, being: the components M and N comprising respectively the projections of the segment on orthogonal X and Y axes; the direction of the segment; the type of vector to be drawn; the type of line to be drawn; characterised in that said vector generator comprises:

a data bus;

an address bus;

means connected to said data bus for forming the dots of the segment comprising: a discrete frequency multiplier for multiplying the frequency of a clock signal by a factor N/M, starting means for enabling said dot forming means and stopping means for terminating said dot forming means;

means for identifying the relative order of the parameters M and N;

means for initializing said dot forming means;

first and second registers connected to the data bus and to the address bus for storing data words which specify the values of the parameters M and N;

a register connected to the data bus and to the address for storing an instruction word which specifies the direction of the segment and the type of segment to be drawn;

a register connected to the data bus and to the address bus for storing a control word which specifies the type of line to be drawn;

a writing pointer comprising two registers, namely an X register and a Y register respectively corresponding to the X and Y axes and connected to said dot forming means; and

means for punctuating the drawing of a segment.

4,311,999

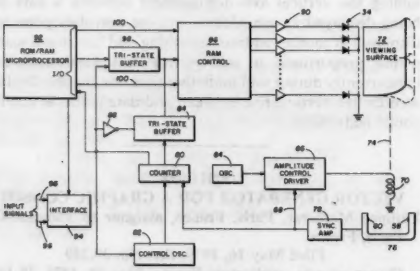
VIBRATORY SCAN OPTICAL DISPLAY

Hubert W. Upton, Arlington, and James R. Goodman, Euless, both of Tex., assignors to Textron, Inc., Providence, R.I.

Filed Feb. 7, 1980, Ser. No. 119,469

Int. Cl.³ G06F *3/14*

U.S. Cl. 340—755 **17 Claims**



1. A raster-type personal display system for providing an image of displayed information in the field of view of an observer, comprising:

means for mounting a mirror in the field of view of an observer,

a plurality of light sources,

an array of fiber optic filaments mounted in a cantilever arrangement and each having one end in a fixed position to receive light from said sources and a second end positioned to be visible to an observer by the mirror and free to translate within fixed display limits,

means for imparting a vibrating motion to the second end of said fiber optic filaments within the fixed display limits to produce a two dimensional display reflected from the mirror to the observer, and

means responsive to drive signals to energize said plurality of light sources in a pattern to display desired information at the vibrating second end of said fiber optic filaments.

4,312,000

DRIVING TECHNIQUE FOR ELECTROCHROMIC DISPLAYS OF THE SEGMENTED TYPE INCLUDING MEANS FOR DETECTING A CHANGE IN THE DISPLAY STATE OF THE SEGMENTS THEREOF

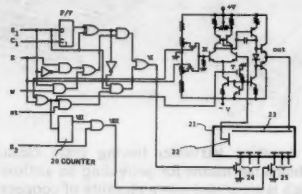
Hisashi Uede; Yasuhiko Inami; Hiroshi Hamada, all of Tenri; Tadanori Hishida, Kashihara, and Hiroshi Nakauchi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 751,819, Dec. 17, 1976. This application Apr. 20, 1978, Ser. No. 898,121

Claims priority, application Japan, Dec. 19, 1975, 50-152354; Dec. 19, 1975, 50-172725[U]

Int. Cl.³ G06F *3/14*; G09F *9/32*

U.S. Cl. 340—785 **9 Claims**



1. A driver circuit for an electrochromic display which includes an electrochromic material and a predetermined number of display segments, combinations of the display segments each defining a different one of a desired number of display patterns, said driver circuit comprising:

circuit means for changing the direction of current flowing through said electrochromic display in response to a write signal and an erase signal;

latch means for storing a specific segment selection signal applied thereto, said specific segment selection signal being provided for a specific one of said predetermined number of display segments;

exclusive OR logic means responsive to the output of said latch means and a new specific segment selection signal directly applied thereto for determining coincidence therebetween;

comparator logic means responsive to said specific segment selection signal, said write signal and said erase signal for determining the phase of said specific segment selection signal with respect to said write signal and said erase signal; and

switching means responsive to the output of said exclusive OR logic means and the output of said comparator logic means for actuating said specific display segment of said predetermined number of display segments.

4,312,001

DEVICE FOR THE TRANSMISSION OF MEASURED VALUES

Rene Marzolf, Eschborn, Fed. Rep. of Germany, assignor to VDO Adolf Schinling AG, Fed. Rep. of Germany

Filed Dec. 4, 1979, Ser. No. 100,034

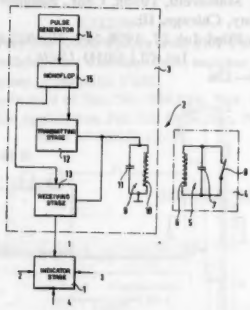
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1978, 2854199

Int. Cl.³ G08B *21/00*; B60C *23/00*

U.S. Cl. 340—870.16 **9 Claims**

1. A device for the transmission of a measured value from a movable object to an object fixed relative thereto, particularly from a vehicle wheel to the chassis of a motor vehicle, comprising a transmitting stage which transmits a frequency signal and contains an oscillatory circuit, a receiving stage which contains an oscillatory circuit, and a coupling circuit provided

on the movable object by way of which circuit a frequency signal can be fed to the receiving stage, characterized in that the oscillatory circuit for the transmitting and receiving stages comprises a single oscillatory circuit common to both stages, means for alternately switching the transmitting stage and the receiving stage to the operative position, said means comprising switches controlled by a pulse generator, which switches switch during a specific first period the transmitting stage to the operative position, and during a specific second period, which follows the first period, switch the receiving stage to the operative position, and means are provided which damp the oscillatory circuit before the receiving stage is switched to the operative position.



4,312,002

COMBINED RADAR AND INFRARED SCANNING ANTENNA

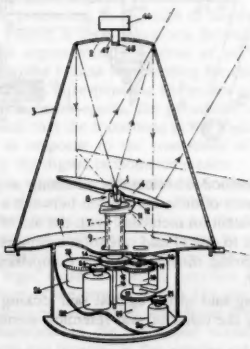
Douglas E. Stewart, Frimley Green, England, assignor to Marconi Company Limited, England

Continuation of Ser. No. 940,565, Sep. 8, 1978, abandoned. This application Jul. 17, 1980, Ser. No. 169,604

Claims priority, application United Kingdom, Sep. 13, 1977, 38126/77

Int. Cl.³ H01Q *21/28, 19/18*

U.S. Cl. 343—725 **2 Claims**



1. An antenna system for ground-based radar equipment, comprising:

(a) a parabolic reflector facing vertically downwards,

(b) a reflector plate mounted underneath said parabolic reflector and facing generally upwards,

(c) a primary aerial element located at the focus of said parabolic reflector and directed towards it for the transmission and/or reception of a primary beam of radio waves, said primary beam being reflected by said parabolic reflector and by said reflector plate,

(d) a secondary, infrared, receiver element mounted on the axis of said parabolic reflector and directed toward said plate reflector for the reception of a secondary, infrared, beam, said secondary beam being reflected by said reflector plate only,

(e) mounting means for supporting said reflector plate at a variable angle with respect to the geometric axis of the parabolic reflector,

(f) said primary and secondary beams being steered in unison by movement of said reflector plate mounting means,

(g) said mounting means comprising

a first member which is mounted for rotation about the geometric axis of the parabolic reflector, said first member pivotally supporting said reflector plate at said variable angle,

a second member which is mounted for rotation about said geometric axis, and

a mechanical coupling between the reflector plate and the second member, said mechanical coupling comprising one coupling member consisting of a cam follower and another coupling member consisting of a cam, one of said coupling members being secured to the reflector plate and the other coupling member being secured to the said second member, the cam follower bearing against the cam so that said variable angle is dependent upon the angular displacement about said geometric axis of the second member relative to the first member,

(h) said mounting means permitting movement of said primary and secondary beams through 360° in azimuth and 180° in elevation, and

(i) an all-round radome housing embracing the primary aerial element and the reflector plate and permitting the transmission of electromagnetic radiation therethrough at all angles of azimuth.

4,312,003

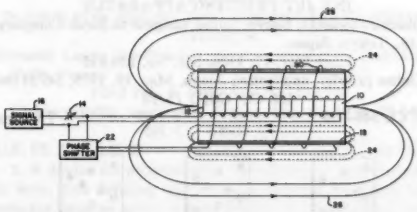
FERRITE ANTENNA

Henry M. Robbins, Jr., Pittsburgh, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Sep. 15, 1980, Ser. No. 187,092

Int. Cl.³ H01Q *7/08*

U.S. Cl. 343—788 **5 Claims**

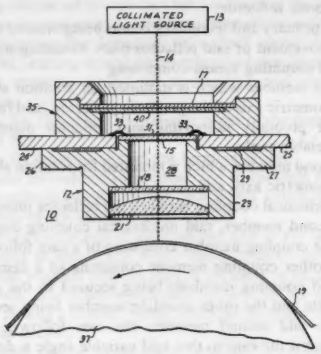


1. In an antenna system, a first antenna coil connected to a signal source, a cylinder of magnetically-permeable material coaxial with and surrounding said first antenna coil, and a second coil for inducing magnetic flux in said cylinder and connected to a signal source which is 180° out of phase with respect to said first-mentioned signal source to thereby create a magnetic field in opposition to that produced by the antenna and force the magnetic flux from the antenna further away from the axis of the antenna.

4,312,004
METHODS AND APPARATUS FOR RECORDING ELECTRIC SIGNALS

Norbert E. Samek, Sierra Madre; Thomas H. Garland, El Monte, and Robert J. Connor, Duarte, all of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed May 7, 1979, Ser. No. 36,612
Int. Cl.[3] G01D *15/14*
U.S. Cl. 346—1.1 8 Claims



1. In a method of recording electric signals on a recording medium having a light sensitivity extending from wavelengths longer than 475 nm to wavelengths shorter than 475 nm, the improvement comprising in combination the steps of:

providing an array of electrically switchable, lanthanum modified lead zirconate titanate (PLZT) light gates between a light polarizer and a complementary light analyzer;

illuminating said light gates through said polarizer with light whose wavelengths essentially is longer than 475 nm within the light sensitivity of said recording medium;

electrically switching light gates among said illuminated light gates with said electric signals to gate light whose wavelength essentially is longer than 475 nm selectively through switched illuminated light gates and said analyzer; and

exposing said recording medium, having a light sensitivity extending to wavelengths shorter than 475 nm, to said selectively gated light whose wavelength essentially is longer than 475 nm.

4,312,005
INK JET PRINTING APPARATUS

Kyuhachiro Iwasaki, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 17, 1980, Ser. No. 130,915
Claims priority, application Japan, Mar. 19, 1979, 54/31186
Int. Cl.[3] G01D *15/18*
U.S. Cl. 346—75 7 Claims

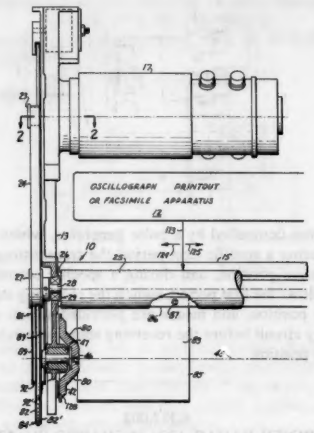
1. An ink jet printing apparatus including nozzle means for ejecting a stream of minute ink particles, charging means for selectively charging the ink particles and first deflection electrode means for selectively deflecting the ink particles along a first axis onto a surface for printing, characterized by comprising:

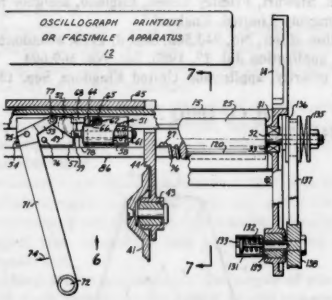
second deflection electrode means for deflecting the ink particles along a second axis which is perpendicular to the first axis so as to form a cluster of ink particles having a diameter equal to a desired dot size on the surface.

4,312,006
METHODS AND APPARATUS FOR RECORDING INFORMATION SUPPLYING WOUND MATERIALS AND RETAINING TUBULAR OBJECTS

Lawrence V. Maldarelli, Tustin, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jul. 17, 1978, Ser. No. 925,498
Int. Cl.[3] G01D *15/28*
U.S. Cl. 346—136 66 Claims





1. In a method of releasably retaining any one of several tubular objects of different lengths between a pair of mutually adjustable retention members, with the aid of a carriage movable relative to one of said retention members, a locking member, and a spring, the improvement comprising in combination the steps of:

positioning said spring against said locking member;

mounting the other of said retention members on said carriage;

rendering said locking member movable along with said carriage and said carriage movable relative to said locking member;

placing said retention members against opposite ends of any one of said tubular objects by moving the carriage and the locking member toward said one retention member;

arresting said locking member against movement away from said one retention member;

moving said carriage and said other retention member

toward said one retention member after said arrestation of the locking member, until said retention member comes to a stop against said one tubular object; and

resiliently biasing one of said retention members against said one tubular object and said one tubular object against the other retention member by compression of said spring against said locking member.

4,312,007

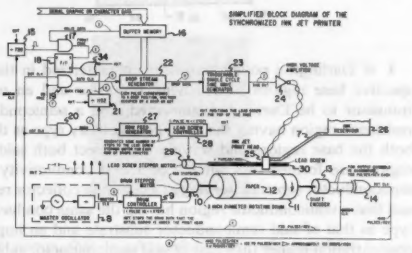
SYNCHRONIZED GRAPHICS INK JET PRINTER

Augustus W. Winfield, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 959,816, Nov. 9, 1978, abandoned. This application Jul. 26, 1979, Ser. No. 61,134

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **2 Claims**



1. An ink jet printing apparatus for printing indicia representing data supplied by a data source, the apparatus comprising:

a cylindrical drum, rotatable about its longitudinal axis, for receiving upon the outside of its cylindrically curved surface a sheet of a recording medium onto which the indicia is to be printed;

a motor, for rotating the cylindrical drum about the longitudinal axis at some generally constant angular velocity, the rotation producing a repetitive and generally periodic displacement of the recording medium along a cylindrical path;

digital tachometer means, for indicating as some fixed number of pulses per revolution the angular velocity at which the cylindrical drum actually rotates;

logic means for producing, in response to the data supplied by the data source, a logic waveform having a series of logical values representing the series of ink drops that corresponds to the indicia representing the data, and also for synchronizing, in response to the pulses generated by the digital tachometer means, the generation of the logic waveform such that the transitions in the logic waveform occur only in response to the transitions of the pulses generated by the digital tachometer means;

wave generation means, for generating individual generally sinusoidal cycles of a waveform, the sinusoidal cycles having a given period and there being a single sinusoidal cycle synchronous with and in response to each logical value representing an ink drop, the recited synchronization of the logic means rendering harmless to the positional accuracy of the printed indicia any decrease in the angular velocity of the rotating cylindrical drum, and also rendering harmless to the positional accuracy of the printed indicia any increase in the angular velocity of the rotating cylindrical drum provided the increase is consistent with the ability of the wave generation means to sequentially and completely generate each of the individual sinusoidal cycles; and

an electrically driven and piezoelectrically actuated ink jet print head, mounted in close physical proximity to the rotating cylindrical drum such that ink drops discharged by the ink jet print head impinge upon the recording medium, and whose piezoelectric actuating device is electrically connected to the output of the wave generation means, the ink jet print head for forming indicia on the recording medium by discharging an ink drop for each sinusoidal cycle generated by the wave generation means.

4,312,008

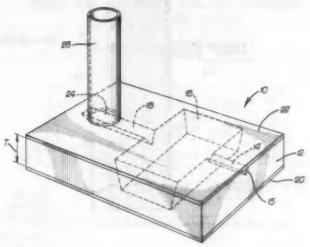
IMPULSE JET HEAD USING ETCHED SILICON

Howard H. Taub, San Jose, and Peter H. Wolf, Mission Viejo, both of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Filed Nov. 2, 1979, Ser. No. 90,552

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **10 Claims**



1. An impulse jet head structure, comprising:

a silicon body section having a front edge and upper and lower surface, said body section including a first groove etched into one of said surfaces and extending rearwardly from the front edge, an etched cavity extending through the body from the upper to the lower surface and coupled to the rear of the first groove, and a second groove etched into one of said surfaces and coupled to the cavity;

a base plate bonded to the lower surface of the body section;

a piezoelectric crystal driver bonded to said base plate;

an upper plate bonded to the upper surface of said body section, one of said plates including a supply opening over the second groove, the combination of the first groove and one of the plates defining a conduit and orifice through which ink is ejected from the cavity and the combination of the second groove and one of the plates defining a supply conduit; and

a supply tube for supplying ink to the cavity, said supply tube being attached to one of the plates and covering said supply opening.

4,312,009

DEVICE FOR PROJECTING INK DROPLETS ONTO A MEDIUM

Francois Lange, Ris-Orangis, France, assignor to Smh-Adrex, Paris, France

Filed Feb. 5, 1980, Ser. No. 118,726

Claims priority, application France, Feb. 16, 1979, 79 04012

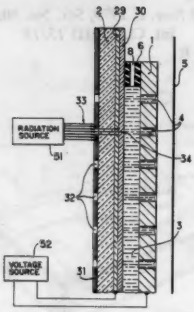
Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **11 Claims**

1. A device for projecting ink droplets onto a medium so as to form dots defining one or more patterns, said dots being selected from an array of dots, the device comprising a perforated first plate which in use is adapted to be positioned substantially parallel to and spaced by a small distance from the medium, a second plate attached and substantially parallel to the first plate and defining therewith a chamber for containing ink to be deposited on the medium, and means for projecting from a selected hole in said perforated first plate a small quantity of ink by the application of voltage to at least one plate in conjunction with the passage of electromagnetic radiation through the second plate, wherein the improvement comprises:

said second plate comprises a layer of photoconductive material whose electrical resistivity is reduced by exposure to electromagnetic radiation and a layer of electrically conductive material which is transparent to said radiation disposed in current conductive relation to the side of said photoconductive layer opposite the ink chamber side and

an electrically conductive member disposed on the ink chamber side of said photoconductive layer, said device



being adapted to have a preselected voltage applied between said electrically conductive layer and member, the value of said voltage being chosen such that exposure of a region of the photoconductive layer registered with a selected hole in said perforated first plate to electromagnetic radiation of predetermined intensity will permit sufficient current flow between the electrically conductive layer and member through said region of photoconductive material to expel an ink droplet from the selected hole as a result of local thermal expansion of the ink.

4,312,010

INK JET PRINTER

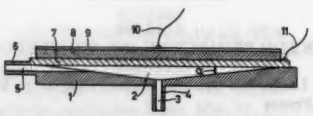
Michael Döring, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 2, 1980, Ser. No. 165,175

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1979, 2927488

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **4 Claims**



1. An ink jet printer, comprising at least one conical pressure chamber which comprises a supply duct for ink which opens into the cone envelope and a discharge duct which leads to a jet nozzle and which is arranged in the apex of the cone, the base of said pressure chamber being constructed as a diaphragm and forming a part of a piezoelectric crystal transducer by means of which the ink can be subjected to a changing pressure for the drop-wise ejection of ink via the jet nozzle, characterized in that the pressure chamber is shaped as a cone, the diameter of the base thereof being several times larger than the height, so that the cone envelope encloses a very acute angle (α) with respect to the base, the edges of the cone envelope and the base being in immediate contact with each other, the supply duct opening into the pressure chamber at the area of the connection between the cone envelope and the base.

4,312,011

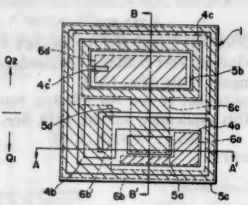
DARLINGTON POWER TRANSISTOR

Kazuo Kanbayashi, Maebashi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 9, 1979, Ser. No. 10,995

Int. Cl.³ H01L *27/02, 29/34, 29/40*

U.S. Cl. 357—46 **8 Claims**



1. A Darlington power transistor characterized in that respective base regions of a driving transistor and an output transistor to be Darlington-connected, and a semiconductor resistance region having the same conductivity type as that of both the base regions and serving to connect both said base regions are formed in a surface of a first conductivity type semiconductor substrate serving as a common collector region; and that a semiconductor region having the same conductivity type as that of said semiconductor substrate and an impurity concentration higher than that of said semiconductor substrate is formed in the semiconductor substrate surface between at least one of said base regions and said semiconductor resistance region and at a position apart from said at least one base region and said semiconductor resistance region.

4,312,012

NUCLEATE BOILING SURFACE FOR INCREASING THE HEAT TRANSFER FROM A SILICON DEVICE TO A LIQUID COOLANT

Rudolf G. Frieser, Poughkeepsie, and Morton D. Reeber, Shrub Oak, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

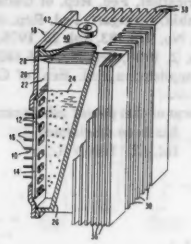
Continuation of Ser. No. 854,956, Nov. 25, 1977. This application Oct. 9, 1979, Ser. No. 83,039

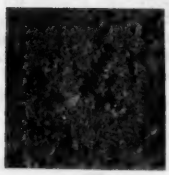
Int. Cl.³ H01L *25/04, 23/02*

U.S. Cl. 357—82 **1 Claim**

1. In a silicon integrated circuit device adapted for immersion in a fluorocarbon liquid coolant in a semiconductor package, the improvement comprising an intricate surface morphology on the back side surface of said device that in use provides enhanced nucleate boiling characteristics, said surface characterized as porous and sponge-like, said surface embodying very small interconnected irregular shaped cavities that have a depth greater than the diameter and are of a shape and size to

preclude wetting of the interior surfaces by said fluorocarbon liquid coolant, said surface morphology formed in monocrystalline silicon that is substantially free of crystalline lattice damage.

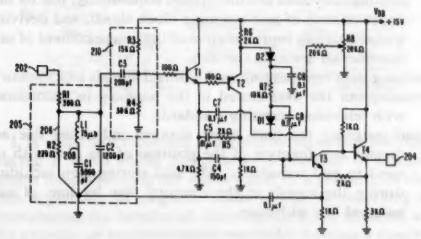




4,312,013
NON-LINEAR APERTURE CORRECTION CIRCUIT

Frank B. Lang, Princeton Junction; John J. Gibson, Princeton, and Michael D. Ross, Somerdale, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 19, 1979, Ser. No. 75,331
Int. Cl.³ H04N *5/76*
U.S. Cl. 358—8 **10 Claims**



1. In a disc record player for information recovery of video and sound signals, an apparatus including: means for recovering modulated information signals including composite color video signals with sound accompaniment from a disc record, said recovery means having a non-linear response which produces intermodulation products between said video and sound signals; means for demodulating said information signals; means, coupled to said demodulating means, for processing said demodulated signal; and means, connected to said recovery means, for providing compensation for said intermodulation products produced by said recovery means, said means for providing compensation comprising:

a signal shaping circuit connected to said recovery means including;

means for reducing the level of the modulated information signals and for providing a resistive source impedance;

means for rejecting a signal of a given frequency; and

means for shifting the phase of the modulated information signals;

an amplifier;

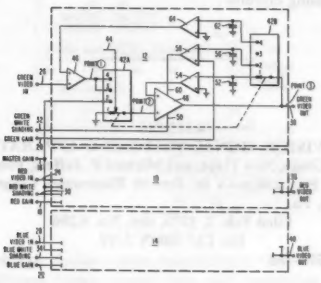
a non-linear signal path connecting the output of said signal shaping circuit to the input of said amplifier; and

a linear signal path connected in parallel arrangement with said non-linear path.

4,312,014
INPUT VIDEO PROCESSOR FOR COLOR TELEVISION CAMERAS

John O. Ryan, Cupertino, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 11, 1980, Ser. No. 139,508
Int. Cl.³ H04N *9/535*
U.S. Cl. 358—41 **16 Claims**



1. A circuit for receiving a video signal derived in part via the horizontal line scans of a pickup tube in the red, green and blue channels of a video camera, and for selectively controlling the circuit gain in response to a gain control voltage and individual channel gain control voltages, comprising;

a single modulator having a pair of inputs, a gain control terminal and an output and disposed in each red, green and blue channel, and responsive to the master gain control voltage; and

feedback amplifier means selectively coupled from the output to the gain control terminal of the modulator and responsive to the respective individual channel gain control voltages independent of the master gain control voltage.

4,312,015
AUTOMATIC MRT SYSTEM

Joseph G. B. Montminy, Quebec, and Paul C. Chevrette, Neufchatel, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jun. 3, 1980, Ser. No. 156,026
Claims priority, application Canada, Jul. 27, 1979, 332644
Int. Cl.³ H04N *9/04*
U.S. Cl. 358—139 **6 Claims**

1. Testing equipment for a system having a first set of optical components and signal processing circuits supplying a raster-type display and display driver circuits for said display comprising:

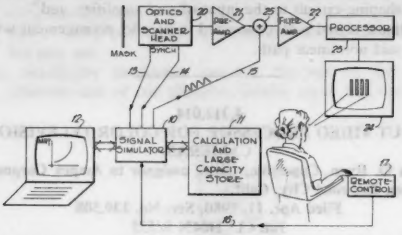
means providing a signal simulating a test object,

means providing a transfer function representative of the impulse response of the first set of optical components and signal processing circuits,

means modifying said signal by said transfer function,

means providing a signal representation of background radiation, and

means summing the modified signal and the background signal and injecting said summed signal into said system at



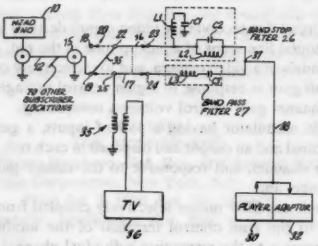
the output of said first set of optical components and signal processing circuits.

4,312,016

TELEVISION SIGNAL SWITCHING APPARATUS

Joseph B. Glaab, New Hope, and Michael F. Jeffers, Flourtown, both of Pa., assignors to Jerrold Electronics Corporation, Hatboro, Pa.

Filed Feb. 2, 1979, Ser. No. 9,286
Int. Cl.³ H04N 5/44
U.S. Cl. 358—188 **6 Claims**



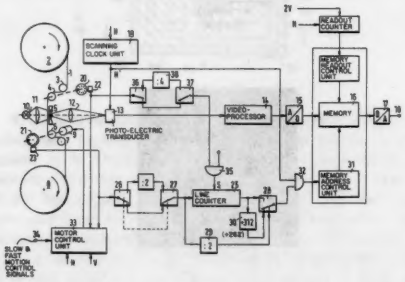
1. In combination in television game switching apparatus, circuit terminal means for receiving a signal ensemble including at least one standard television program and at least one video game program instruction set, said program instruction set signal component occupying a predetermined frquency band, a cable, a television game player connected to one end of said cable and adapted to supply said cable with a video game radio frequency signal in a game video frequency band distinct from said predetermined frequency band, adaptor means connected to said cable one end for receiving said video game program instruction set signal component and for storing said program instruction set signal, output terminal means adapted for connection to a standard television receiver, and switching and filter means connecting said circuit terminal means, output terminal means and a second end of said cable, said switching and filter means including means for connecting said circuit terminal means and said output terminal means when said switching means resides in a first state, said switch and filter means further including first filter means for blocking said game video frequency band and for passing said instruction set predetermined frequency band connecting said circuit terminal means and said second cable end and game video passing means connecting said output terminal means and said second cable end when said switching means resides in a second state.

4,312,017

METHOD AND SYSTEM TO SCAN MOTION PICTURE FILM TO DEVELOP TELEVISION SIGNALS

Dieter Poetsch, Darmstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 928,783, Jul. 28, 1978. This application Jun. 2, 1980, Ser. No. 155,182
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1977, 2735685
The portion of the term of this patent subsequent to Sep. 8, 1998, has been disclaimed.
Int. Cl.³ H04N 3/36
U.S. Cl. 358—214 **20 Claims**



1. Method of scanning continuously moving motion picture film (1) to derive television signals, having

a transducer (13) sequentially scanning incremental areas of the film along a line,

comprising the steps of

generating a scanning clock signal having a repetition rate which is independent of movement of the film, and having a fixed scanning clock frequency for a fixed representational format of the scenes depicted on the frames of the film;

controlling said transducer by said scanning clock signal to continuously scan the film frame, sequentially, line by line under control of said scanning clock signal, and deriving scanned signals representative of the image content of said incremental areas on the film;

storing data representing said scanned signals in a memory;

reading-out the data stored in the memory in accordance with television scanning standards;

and assigning the lines being scanned individual line addresses as a function of the position of the film with respect to said transducer (13), said storing step including storing the signals in the memory, line by line, at said assigned line addresses.

4,312,018

DEMODULATOR IN A FACSIMILE SYSTEM

Takashi Nakajiri, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 30, 1980, Ser. No. 116,988
Claims priority, application Japan, Jan. 31, 1979, 54-00053
Int. Cl.³ H04N 1/40, 7/12
U.S. Cl. 358—261 **5 Claims**

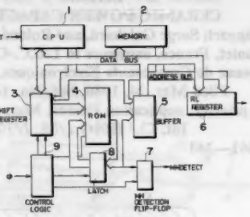
1. A demodulator system for a facsimile receiver comprising:

a programmed demodulation table for converting received MH code (Modified Huffman Code) information into run length information;

input means for sequentially shifting said received MH code information and applying an input data to said programmed demodulation table;

feed-back means for feeding back a portion of an output data from said programmed demodulation table to said pro-

grammed demodulation table as a portion of the input data thereto until said input data corresponds to any one of MH codes programmed in said programmed demodulation table; and



output means for forming run length information through the use of the output data derived from said programmed demodulation table when the input data applied to said programmed demodulation table becomes identical with any one of MH codes programmed in said programmed demodulation table.

4,312,019

PHASE CORRECTED VIDEO RECORDING SYSTEM

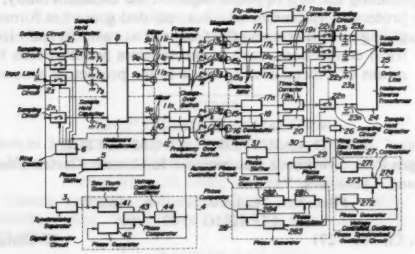
Kenji Kimura, Tachikawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1980, Ser. No. 119,115

Claims priority, application Japan, Feb. 13, 1979, 54-15330

Int. Cl.³ H04N *5/795*

U.S. Cl. 360—22 **4 Claims**



1. A video tape recording apparatus for recording and reproducing a video signal comprising: a plurality of channels, means for distributing the video signal to a plurality of channels, a plurality of magnetic heads, means for recording and reproducing the distributed video signals in the channels with the plurality of magnetic heads, means for forming a time-base correction signal synchronous with a sampling signal for Hadamard transformation, and means for detecting and phase-controlling a sampling signal for Hadamard inverse transformation to the phase of the time-base correction signal.

4,312,020

FREQUENCY RESPONSE ADJUSTING DEVICE FOR MAGNETIC SOUND RECORDER

Tsunao Hasegawa, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

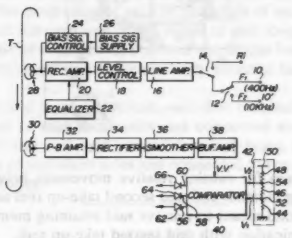
Filed Jul. 17, 1979, Ser. No. 58,326

Claims priority, application Japan, Jul. 18, 1978, 53-87918; Dec. 12, 1978, 53-171790[U]

Int. Cl.³ G11B *5/45, 5/02, 27/36*

U.S. Cl. 360—65 **11 Claims**

1. A device for adjusting the frequency response characteristic of a magnetic sound recorder, comprising two signal supply means for producing respective electric output signals having different frequencies; switching means shiftable between said two signal supply means; signal modifier means operative to modify each of said output signals selectively passed through said switching means; electromagnetic recording means for producing on a magnetic recording medium a magnetic signal corresponding to the electric signal delivered from said signal modifier means; electromagnetic playback means for producing an electric signal corresponding to said magnetic signal; d.c. voltage generating means operative to produce a d.c. voltage variable with the signal level of the electric signal produced by said playback means; comparing means electrically connected to said d.c. voltage generating means and operative to compare said d.c. voltage with at least one reference voltage for producing a one of at least two different output signals when the d.c. voltage is lower than said at least one reference voltage and another of said at least two different output signals when the d.c. voltage is higher than the reference voltage; display means responsive to each of said at least two different output signals from said comparing means for producing a visible signal indicative of each of said at least two different output signals from the comparing means; and reference signal supply means for delivering to said comparing means a predetermined first reference voltage and a predetermined second reference voltage higher than said first reference voltage, said comparing means having first, second and third output terminals connected in parallel to said display means and being operative to produce a first output signal on the first output terminal thereof when said d.c. voltage is lower than said first reference voltage, a second output signal on the second output terminal thereof when said d.c. voltage is higher than said first reference voltage and lower than said second reference voltage, and a third output signal on the third output terminal thereof when said d.c. voltage is higher than said second reference voltage.



4,312,021

CASSETTE APPARATUS AND METHOD FOR RETAINING SELECTED SEGMENTS OF TAPE

Fred C. Bolick, Jr., Atlanta, Ga., assignor to Lanier Business Products, Inc., Atlanta, Ga.

Filed Nov. 13, 1979, Ser. No. 93,165

Int. Cl.³ G11B *23/02, 27/02*

U.S. Cl. 360—132 **10 Claims**

1. A take-up reel replacement apparatus for replacing a first take-up reel in a tape carrier having an externally accessible take-up reel, and also having a pressure pad and supply reel, with a second take-up reel in order to permit the tape wound on said first take-up reel to be stored, comprising:

a first means for securing said tape carrier when said second take-up reel is substituted for said second take-up reel;

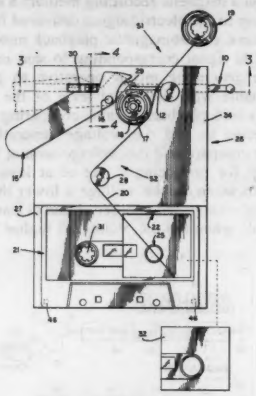
a second means for securing said second take-up reel;

a tape retaining member in communication with said tape withdrawn from said tape carrier mounted for relative movement between said retaining member and said second take-up reel secured by said second means;

a third means for causing relative movement between said retaining member and said second take-up reel secured by said second means to place said tape in communication

with said retaining member and to also communicate with said second take-up reel;

a fourth means for causing said tape retained by said retaining member to be secured in said second take-up reel; and



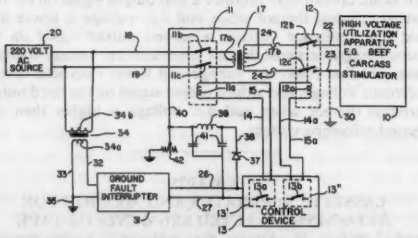
a fifth means for causing relative movement between said retaining member and said second take-up reel secured by said second means to remove said retaining member from communication with said second take-up reel.

4,312,022

SHOCK HAZARD PROTECTIVE APPARATUS FOR HIGH VOLTAGE SYSTEM

Eddie H. Bailen, Omaha, Nebr., assignor to Omeco-St. John Co., Omaha, Nebr.

Filed Nov. 7, 1979, Ser. No. 92,223
Int. Cl.³ H02H 3/33
U.S. Cl. 361—46 **8 Claims**


220 VOLT AC SOURCE
HIGH VOLTAGE UTILIZATION APPARATUS, E.G. BEEF CARCASS STIMULATOR
GROUND FAULT INTERRUPTER
CONTROL DEVICE

8. A protective apparatus for providing protection in an ungrounded high voltage electrical system and comprising:

control means including a switch in said system for establishing whether high voltage power exists therein or not, said control means having an input and requiring the supply of electrical power at said input before said switch can be closed to cause high voltage power to exist in said system;

means including a ground fault interrupter and two wires connecting the interrupter to said input for supplying said electrical power to said input, one of said wires being connected to ground through the interrupter; and

means including a rectifier connecting the other of said two wires to said system;

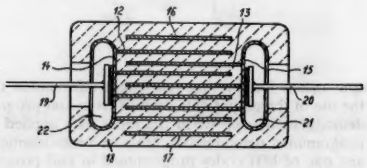
whereby if some portion of said system accidentally becomes grounded and therefore the system presents a shock hazard, said grounding provides a drain to ground from the interrupter through said last mentioned connection and thereby causes said interrupter to disconnect said control means from its supply of electrical power with the result that said switch will be open.

4,312,023

CERAMIC POWER CAPACITOR

Pierre Frappart; Serge Guichard, and Roland Saint Marcoux, all of Bagnolet, France, assignors to L.C.C.-C.I.C.E. Compagnie Europeenne de Composants Electroniques, Bagnolet, France

Filed Mar. 24, 1980, Ser. No. 133,269
Claims priority, application France, Mar. 23, 1979, 79 07388
Int. Cl.³ H01G 1/08, 1/10
U.S. Cl. 361—243 **7 Claims**



1. A multilayer ceramic power capacitor comprising:

a stack of ceramic dielectric films separating metal foils arranged in two alternating series,

said ceramic dielectric films each having a thickness between 20 and 200 microns,

said foils each having a thickness between 2 and 10 microns, thus constituting means for removing the heat produced within the capacitor by dielectric losses, and

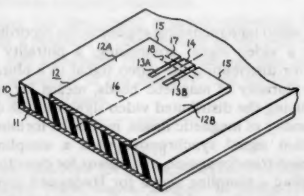
the dielectric films having larger dimensions than the foil forming on two opposite faces of the capacitor body, a protective volume in which a rounded groove is formed giving an anti-corona effect, as well as two external electrical connections, each connected to a series of foils by means of a metal coating made in the protective groove.

4,312,024

FIXED ADJUSTED FLAT CAPACITOR

Jurgen Pest, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Apr. 24, 1980, Ser. No. 143,195
Int. Cl.³ H01G 4/40, 7/00
U.S. Cl. 361—271 **13 Claims**



1. An improved capacitor arrangement comprising:

a. a sheet of insulating material having first and second opposing surfaces;

b. a first metallic sheet provided on said first surface;

c. a second metallic sheet provided on said second surface;

d. said second metallic sheet being completely divided along a first line into two portions to form a first capacitor between said two portions, and to form a capacitor between each of said two portions and said first metallic sheet respectively;

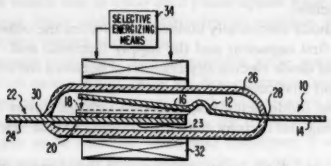
e. each of said portions having an adjusting part;

f. and each of said adjusting parts being divided along a second line positioned at a selected location, and extending in a direction at a substantial angle to said first line.

4,312,025
MAGNETIC VARIABLE CAPACITOR

Lawrence A. Boyer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 6, 1978, Ser. No. 967,095
Int. Cl.³ H01G 7/00, 5/16
U.S. Cl. 361—289 13 Claims

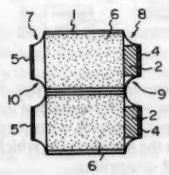


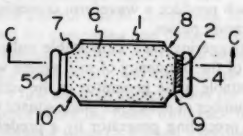
1. A capacitor comprising:
a cantilevered strip of sheet non-magnetic electrically conductive material supported at one end thereof,
a layer of electrically insulating material,
a cantilevered strip of sheet magnetic electrically conductive resilient material supported at one end thereof at least a portion of which is spaced from and juxtaposed with at least a portion of said non-magnetic material in a first spaced position, with said layer between the two sheets, to form a capacitor, and
means for producing a magnetic field for magnetically displacing said strip of magnetic material to a second different spaced position abutting said layer of insulating material adjacent said non-magnetic material to change the capacitance exhibited by said capacitor to a value determined by the thickness of said insulating material, said non-magnetic strip being relatively rigid and remaining in a fixed position in the presence of the displacement of said strip of magnetic material to a position abutting said layer of insulating material.

4,312,026
CHIP CERAMIC CAPACITOR

Shoichi Iwaya, Kisagata, and Sho Masujima, Tokyo, both of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1980, Ser. No. 135,094
Claims priority, application Japan, Apr. 11, 1979, 54-47635[U]; Apr. 11, 1979, 54-47636[U]; May 31, 1979, 54-73779[U]
Int. Cl.³ H01G 4/12, 4/38
U.S. Cl. 361—321 9 Claims





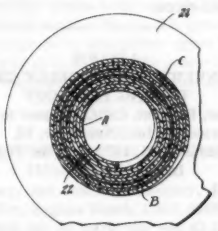
1. A capacitor assembly comprising an elongated rectangular dielectric body, the dielectric body having a plurality of pairs of U-shaped spaces along the longitudinal sides thereof and a slit provided between each pair of U-shaped spaces on the surface of the dielectric body wherein said slits divide the dielectric body into a plurality of body elements, each of said body elements having a pair of opposed electrodes positioned within the dielectric body, and a pair of terminals provided at the opposite sides of the dielectric body positioned between said U-shaped spaces and electrically coupled with corresponding electrodes.

9. A capacitor comprising:
(a) a dielectric body member of a substantially rectangular solid shape, said body member including a pair of parallel long sides, a pair of parallel short sides, said short sides being perpendicular to said long sides, and recessed portions wherein each edge of each of said long sides are joined to a corresponding edge of each of said short sides by said recessed portions extending therebetween such that the projection of each of the edges of said short sides do not intersect any of the edges of said long sides;
(b) a pair of conductive, opposed electrodes having at least a portion of said dielectric body member therebetween; and
(c) first and second terminals, said first terminal being fixed to one of said short sides and connected to one of said electrodes and said second terminal being fixed to the other of said short sides and connected to the other of said electrodes.

4,312,027
MULTIPLE CAPACITOR WINDING WITH ELECTROSTATIC SHIELDING

Robert M. Stockman, Brookfield Center, Conn., assignor to American Radionic Co., Inc., Danbury, Conn.

Filed Jul. 21, 1980, Ser. No. 170,893
Int. Cl.³ H01G 4/38
U.S. Cl. 361—329 2 Claims



2. A multiple element thin film capacitor having electrostatic shielding between multiple element capacitors comprising:
a first capacitor wound from first and second metallized dielectric films each having a metallized side and a non-metallized dielectric side with the metallized side of each film contacting the dielectric side of the other film, and the metallized layers of said first and second films extending to opposite ends of said first capacitor;
a non-metallized region on said first and second metallized films;
a third composite film having a metallized region encircling said first capacitor at least once, forming an electrostatic shield;
said third composite film including insulating means preceding and succeeding said shield which form a barrier on each side of said electrostatic shield which encircles said first capacitor and said shield at least once and isolates said shield from said first capacitor;
a second capacitor wound from said first and second metallized dielectric films over said first capacitor, said electro-

static shield and said barriers on each side of said electrostatic shield;

means for making electrical connections to said first and second capacitors on the edges of said capacitor; and

means for making an electrical connection to said electrostatic shield between said barriers for electrostatically isolating said first and second capacitors.

4,312,028

SHOCKPROOF FLUORESCENT LIGHT FIXTURE

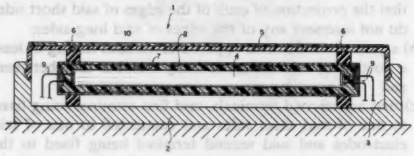
Martin Hamacher, Westerholterstr. 791, 4352 Herten/Westf., Fed. Rep. of Germany

Filed Oct. 12, 1979, Ser. No. 84,194

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1978, 7831005[U]

Int. Cl.³ B60Q *1/00*

U.S. Cl. 362—369 **8 Claims**



1. A light fixture comprising:

a support formed with a recess having an inner wall;

an at least partially transparent lens covering said recess;

a fluorescent tube in said recess;

a transparent and elastomeric cushion sleeve surrounding said tube;

a rigid transparent jacket surrounding said cushion sleeve and spaced inwardly of said inner wall; and

at least one elastomeric holding block engaging inwardly against said jacket and outwardly against said inner wall and supporting said tube via said cushion sleeve and said jacket in said recess.

4,312,029

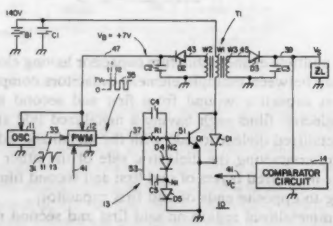
DC-TO-DC CONVERTER WITH REDUCED POWER LOSS DURING TURN OFF

Neale A. Zellmer, Belmont, Calif., assignor to GTE Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed Jun. 22, 1979, Ser. No. 51,090

Int. Cl.³ H02M *3/335*

U.S. Cl. 363—21 **1 Claim**



1. In a voltage converter including a pulse voltage source having an output terminal that is electrically connected through a resistor to the base of a switching transistor that is responsive to voltage pulses of one polarity that are applied to the base thereof for causing the transistor to conduct current through inductive means, the output terminal of the voltage source also being connected to a DC voltage supply terminal only when voltage pulses are absent from the output of the source, the improvement comprising:

a first capacitor for supporting a charge voltage across it that is much greater than that required to cut off the base-emitter diode of the transistor, said first capacitor having one side electrically connected to the output terminal and having an other side;

a second capacitor electrically connected across the resistor, for speeding up turn-on of the transistor in response to generation of a voltage pulse, the capacitance of said first capacitor being much greater than that of said second capacitor;

a first diode electrically connected between the other side of said first capacitor and the supply terminal; and

a second diode electrically connected between the other side of said first capacitor and the base;

said first diode being responsive to voltage pulses for conducting and thereby enabling charging of said first capacitor;

said second diode being responsive to the absence of a voltage pulse on the output terminal and to the charge voltage on said first capacitor for conducting and discharging said first capacitor through the resistor for pulling the base in the reverse direction, to rapidly conduct minority carriers out of the base region of the transistor for rapidly terminating the flow of collector current and decreasing power dissipation in the transistor during turnoff.

4,312,030

SWITCHING WAVEFORM SYNTHESISER FOR POLYPHASE STATIC INVERTERS

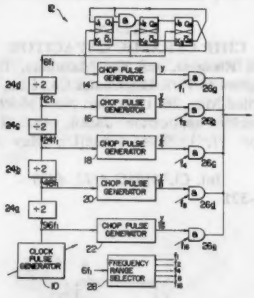
David J. Byers, Univ. of Canterbury, Christchurch, New Zealand

Continuation-in-part of Ser. No. 880,353, Feb. 23, 1978, abandoned. This application Sep. 5, 1979, Ser. No. 72,614

Claims priority, application New Zealand, Feb. 16, 1977, 183352

Int. Cl.³ H02M *1/08*; H02P *13/18*

U.S. Cl. 363—41 **8 Claims**



1. A switching waveform synthesiser for triggering a polyphase static inverter which produces a pulse width modulated waveform the output of which when integrated approximates a sinusoidal system the amplitude of which varies as the system frequency is varied comprising:

a variable frequency poly-phase square wave generator,

a series of n edge-triggered monostable pulse generators which each produce a waveform consisting of a series of fixed duration pulses,

means for triggering each monostable pulse generator at a multiple of the frequency of said square wave generator,

each monostable pulse generator in the series producing a greater number of pulses per phase square wave half-cycle than the preceding generator by a predetermined factor but said pulses being of a lesser duration than the pulses produced by the preceding generator by said predetermined factor,

means which select the output from one of said monostable pulse generators,

a logical inverter fed from said selection means,

logic circuitry associated with the square wave generator which enables the logical inverter output for a predetermined fraction of each square wave half-cycle for each phase,

means which mix or chop each phase square wave with the output from said logic circuitry to produce the static inverter trigger waveforms,

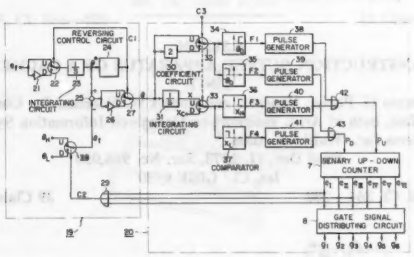
and means controlling said monostable pulse generator selection means which cause the first generator output to be selected when the frequency of the square wave generator is within a high range of frequencies, the second generator output to be selected when said frequency is within an adjacent range of lower frequencies, the selection process continuing as the frequency of the square wave generator decreases through adjacent frequency ranges until the n^{th} generator is selected.

4,312,031

APPARATUS FOR CONTROLLING CURRENT TYPE INVERTERS

Toshiaki Kudor, Inagi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 27, 1979, Ser. No. 97,669
Claims priority, application Japan, Dec. 6, 1978, 53-150703
Int. Cl.[3] H02M 7/155
U.S. Cl. 363—41 **8 Claims**



1. An apparatus for controlling an inverter of the type having a plurality of switching means to be operated to produce a current vector with a specific number of stable phase positions to an AC load, said apparatus comprising:

a phase difference detecting circuit which determines a phase angle at an instant of said current vector from signals representing conductive states of said switching means in the inverter, and detects a phase difference between the phase angle thus determined and a phase angle derived from a reference signal (e_f); and

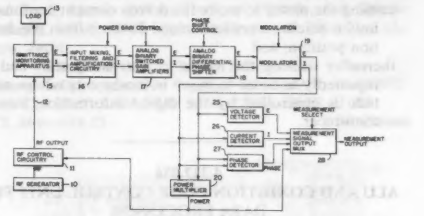
a commutation control circuit comprising first and second comparators for comparing said phase difference (θ) with a positive reference value ($+\theta_o$) and a negative reference value ($-\theta_o$) respectively, and controls the inverter so as to execute a first mode of commutation for advancing the current vector when the phase difference (θ) exceeds the positive reference value ($+\theta_o$) and a second of commutation for reversely rotating the current vector when the phase difference (θ) is reduced below the negative reference value ($-\theta_o$).

4,312,032

RF POWER CONTROL APPARATUS

Thomas J. Kirby, Pelham, N.H., assignor to GTE Products Corporation, Stamford, Conn.

Filed May 2, 1977, Ser. No. 792,510
Int. Cl.[3] H02M 7/537
U.S. Cl. 363—97 **9 Claims**



1. Apparatus for supplying a controlled RF signal to a load including in combination

RF generating means for producing an RF signal to be suplied to the load;

a control loop including

sensing means coupled between the RF generating means and the load for producing a voltage signal representing the instantaneous voltage and a current signal representing the instantaneous current of the RF signal being supplied by the RF generating means to the load;

power signal means coupled to the sensing means for combining said voltage and current signals to produce a power signal related to the power of the RF signal being supplied by the RF generating means to the load; and

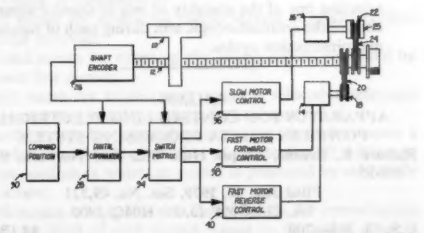
RF control means coupled to the power signal means and to the RF generating means, said RF control means including RF variable amplifier means connected between the RF generating means and the sensing means, the RF variable amplifier means being operable to vary the gain of the RF signal supplied by the RF generating means to the load in response to said power signal from the power signal means so as to maintain the power of the RF signal supplied to the load substantially constant.

4,312,033

DIGITAL MOTOR CONTROL FOR POSITIONING SYSTEM

James S. Sweeney, and James S. Sweeney, Jr., both of 2775 Temple Hills Dr., Laguna Beach, Calif. 92651

Filed Jul. 31, 1979, Ser. No. 62,416
Int. Cl.[3] G06F 15/46; G05B 11/18, 11/28
U.S. Cl. 364—167 **27 Claims**



5. That method of causing a driven element to be moved in one direction only into its predetermined destination position by a motor which moves continuously from its energization until its deenergization, said motor having movement increments of variable magnitude, the beginning position of each

movement increment being determined solely by its energizing signal and the end position of each movement increment being determined solely by its deenergization plus any coasting thereafter, which method comprises:

measuring the position of the driven element with a position-to-digital transducer;

comparing the transducer-measured position with the destination position to determine the error distance;

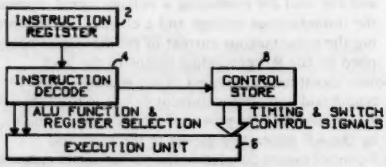
causing the motor to move the driven element continuously until it reaches a predetermined distance from the destination position; and

thereafter causing the motor to alternately start and stop repeatedly in order to move in increments whose magnitude is controlled by the digital information from the transducer.

4,312,034
ALU AND CONDITION CODE CONTROL UNIT FOR DATA PROCESSOR

Thomas G. Gunter; Colleen M. E. Hobbs, both of Austin; Michael E. Spak, Kyle, and Harry L. Tredennick, Austin, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 21, 1979, Ser. No. 41,203
Int. Cl.³ G06F *9/30*
U.S. Cl. 364—200 **4 Claims**



1. A data processor for executing a plurality of macroinstructions, which is adapted for microprogrammed operation whereby the execution of a macroinstruction during a macroinstruction cycle is accomplished by execution of a sequence of microinstructions, each microinstruction being executed during a microinstruction cycle, the data processor comprising:

(a) means for storing a macroinstruction having a field containing control information,

(b) means for storing a microinstruction having a field containing control information,

(c) an arithmetic-logic unit for performing arithmetical and logical operations upon digital information contained in the data processor, and

(d) control means coupled to the arithmetic-logic unit, to the means for storing a macroinstruction and to the means for storing a microinstruction, is responsive to the control field of the macroinstruction for selecting a plurality of sets of control signals during a macroinstruction cycle and responsive to the control field of the microinstruction for selecting one of the plurality of sets of control signals to control the arithmetic-logic unit during each of successive microinstruction cycles.

4,312,035
APPARATUS FOR CONTROLLING ELECTRICAL POWER IN A DATA PROCESSING SYSTEM

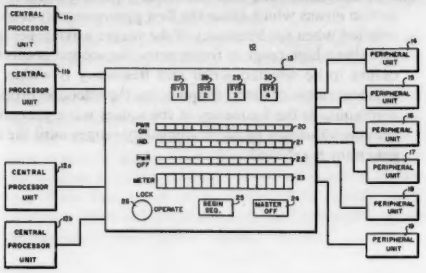
Richard E. Greene, Sasqua Hills Rd., East Norwalk, Conn. 06855

Filed Jun. 18, 1979, Ser. No. 49,321
Int. Cl.³ G06F *15/16*; H04Q *3/00*
U.S. Cl. 364—200 **12 Claims**

1. In a data processing system having one or more central processor units and a plurality of peripheral units selectively connectable thereto, an electrical power control apparatus connected between said central processor units and said peripheral units, said power control apparatus comprising:

means selectively connectable to said peripheral units for selectively connecting a voltage power signal to said peripheral units to cause power to be selectively supplied thereto said means for selectively connecting said voltage power signal to said peripheral units comprising relay means for sequentially connecting said voltage power signal to said peripheral units;

metering means connected to said relay means and activated by connection of said voltage power signal to any one of said peripheral units through said relay means for measuring the amount of time that the selectively connected peripheral unit is supplied with said voltage power signal,



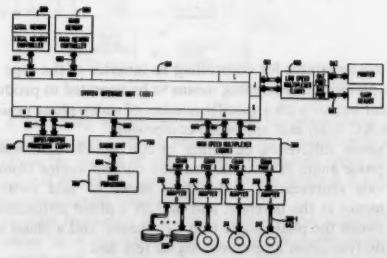
said metering means comprising means connected to each of said peripheral units through said relay means for being separately actuated thereby for separately measuring said amount of connection time of each of said peripheral units, and

indicator means connected to said metering means and said relay means for indicating which of said peripheral units has been turned on by closure of said relay means, whereby said power control apparatus provides centralized power function control and status indication for said peripheral units.

4,312,036
INSTRUCTION BUFFER APPARATUS OF A CACHE UNIT

Marion G. Porter, Phoenix, and Robert W. Norman, Jr., Glendale, both of Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 11, 1978, Ser. No. 968,050
Int. Cl.³ G06F *9/30*
U.S. Cl. 364—200 **39 Claims**



1. A cache unit for use with a data processing unit for providing fast access to data and instructions fetched from a main store coupled to said cache unit in response to commands received from said data processing unit, said cache unit comprising:

instruction address register means coupled to said data processing unit, said instruction address register means including a number of bit positions for storing an address in response to a predetermined type of said commands previ-

ously received from said data processing unit, said address specifying a next instruction word to be accessed by said data processing unit;

an addressable instruction buffer coupled to said main store and to said instruction address register means, said instruction buffer comprising a number of sections, each section comprising:

a plurality of addressable locations for storing a sequence of instruction words received from said main store, each location including a plurality of bit positions for storing an instruction word and at least one bit position connected to switch from a first state to a second state when an instruction word is being written in said location; and,

control means coupled to said instruction address register means, to said processing unit to said main store and to each of said sections of said instruction buffer, said control means being operative in response to a signal corresponding to said second state received from said one bit position of one of said locations specified by said instruction address register means to generate an output signal to said processing unit, said signal indicating that said next instruction word specified by said instruction address register means has been received from said main store and is being written into one of said buffer locations of one of said sections thereby enabling said processing unit to begin immediately the processing of said next instruction specified by said instruction address register means.

4,312,037

ELECTRONIC CASH REGISTER WITH SINGLE PRINTER FOR PRINTING RECEIPTS AND A JOURNAL

Tooru Yamakita, Hamura, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 11, 1979, Ser. No. 102,391

Claims priority, application Japan, Dec. 18, 1978, 53-154939; Dec. 26, 1978, 53-162789

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—405 **11 Claims**

1. An electronic cash register which can successively write and read sales data, comprising:

input means including a data input key for keying in sales data and a journal operation key for indicating a journal preparation;

sales data memory means coupled to said input means for storing successively sales data keyed in by operation of said data input key;

sales data processing means coupled to said input means for classifying sales data keyed in by operation of said data input key into one of a plurality of classifications, and adding together sales data of each classification;

sum memory means coupled to said sales data processing means for storing the sum of the sales data of each classification;

sales data reading means coupled to said sales data memory means for reading successively the sales data from said sales data memory means when said journal operation key is operated; and

a single printer coupled to said sales data reading means for printing sales data whenever the sales data are keyed in by operation of said data input key and for printing successively the sales data read from said sales data memory means by said sales data reading means when said journal operation key is operated.

4,312,038

ELECTRONIC ENGINE CONTROL APPARATUS HAVING ARRANGEMENT FOR DETECTING STOPPING OF THE ENGINE

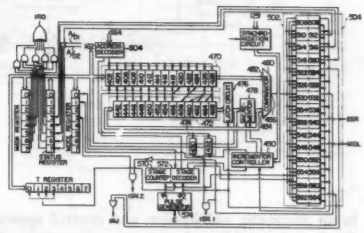
Masumi Imai; Masao Takato, both of Hitachi, and Toshio Furuhashi, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

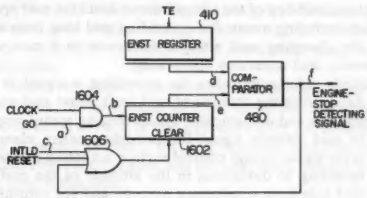
Filed Oct. 18, 1978, Ser. No. 952,531

Claims priority, application Japan, Oct. 19, 1977, 52-125973

Int. Cl.³ F02D *5/00*; F02P *5/08, 11/06*; G05B *15/02*

U.S. Cl. 364—431.12 **29 Claims**





32. For use in a processor-controlled apparatus for controlling the operation of a combustion engine having an output crankshaft driven by mechanical energy converted from heat energy which is released by the combustion of fuel, said engine including at least ignition means for controlling the ignition timing of said engine, in response to control signals coupled thereto, and being coupled to receive signals of said engine, produced by a plurality of sensors indicative of operating conditions of the engine, said sensors including at least an angle sensor for producing an output signal in response to a predetermined angle of rotation of the crankshaft, a control apparatus comprising, in combination:

first means for producing output signals at predetermined time intervals;

second means for counting the output signals produced by said first means;

third means for loading and storing a selectable reference count value supplied thereto by said processor;

fourth means for producing an output dependent upon a selectable degree of rotation of the crankshaft relative to its position at which an output is produced by said angle sensor;

fifth means, coupled to said fourth means, for returning the count total of said second means to its initial value in response to the output of said fourth means;

sixth means for supplying an output to be coupled to said processor means in response to the counted value of said second means reaching said selectable reference count stored by said third means value; and

seventh means, adapted to be coupled to receive data from

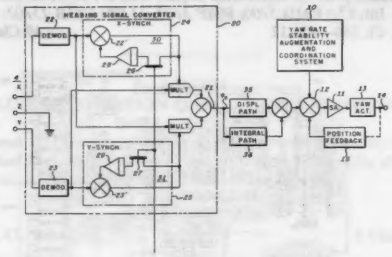
said processor means in accordance with the output of the sixth means, and preventing control signals from being delivered to said ignition means.

4,312,039

TRANSIENT FREE SYNCHRONIZATION SYSTEM

Edmund R. Skutecki, Glendale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Jan. 24, 1980, Ser. No. 114,784
Int. Cl.[3] G06G 7/70; G05D 1/10; B64C 11/34
U.S. Cl. 364—434 6 Claims



1. In an automatic stabilization and control apparatus for aircraft adapted to stabilize short term motion of aircraft about one of its primary axes through a control surface actuator means and including attitude reference means for providing long term stability of the aircraft about said axis, said apparatus further including means for overriding said long term stability and for changing said attitude reference to a new attitude reference, said apparatus comprising:

attitude reference means for providing a signal in accordance with the attitude of said craft about said axis,

clampable and unclampable synchronizing means responsive to said attitude signal for providing when clamped an error signal to said control surface actuating means corresponding to deviations in the attitude of the craft about said axis from a reference attitude and for returning said craft attitude to said reference attitude thereby reducing said error signal to zero and when unclamped for maintaining said attitude error signal effectively zero during said attitude change,

switching means responsive to said overriding means for clamping and unclamping said synchronizer means, said overriding means including:

override command means,

variable pulse width modulator means responsive to initiation and termination of said override command means for providing a first series of pulses of gradually increasing width over a predetermined time period and a second series of pulses of gradually decreasing width over a predetermined period of time, and

means for supplying said first and second series of pulses to said switching means whereby said synchronizer is gradually unclamped upon override initiation and gradually clamped upon override termination.

4,312,040

WELL LOG DEPTH ALIGNING

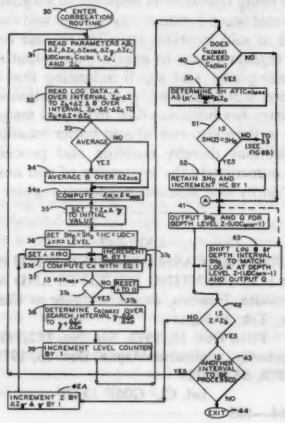
David H. Tinch, New Orleans, La.; Bruce N. Carpenter, Ridgefield, and Elie S. Elishou, Danbury, both of Conn., assignors to Schlumberger Limited, New York, N.Y.

Continuation of Ser. No. 70,709, Sep. 9, 1970, abandoned. This application Aug. 15, 1979, Ser. No. 66,541
Int. Cl.[3] G01V 9/00; G06F 15/20
U.S. Cl. 364—422 23 Claims

1. A method of filtering a selected well log and of producing a tangible representation of the resulting improved, filtered log, said filtering including depth-shifting samples of the selected log relative to a base well log on the basis of depth displacements between said logs whicch have been found to be the least ambiguous ones among a greater number of possible such depth displacements, each of said logs being derived from a respective investigating device passed through a borehole and sampled at separate depth levels, comprising the following steps each of which is carried out by a machine:

(a) producing first and second data signals which correspond to samples which are derived from separate depth levels in a borehole and make up said base log and said selected log respectively;

(b) determining the depth displacement between a selected sample of said first data signals and a corresponding sample of said second data signals which is assumed, as a first assumption, to be derived from the same depth level as said selected sample of first data signals;



(c) repeating said step of determining the depth displacement between a number of successive selected samples of said first data signals and corresponding samples of second data signals;

(d) comparing the depth displacements determined from a number of successive samples for selecting one of said depth displacements as a more accurate depth displacement representation for at least one of said successive samples and for selecting at least one other one of said depth displacements as a more accurate depth displacement representation for at least one other one of said successive samples; and

(e) filtering said selected log by depth-shifting samples thereof relative to the base log on the basis of the depth displacements selected in the immediately preceding step and producing a tangible representation of the resulting filtered well log.

4,312,041

FLIGHT PERFORMANCE DATA COMPUTER SYSTEM

Michael K. DeJonge, Wyoming, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Feb. 22, 1978, Ser. No. 880,219
Int. Cl.[3] G06F 15/50
U.S. Cl. 364—442 25 Claims

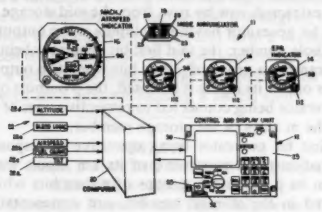
1. An on-board aircraft computer system for use with jet engine powered aircraft, the computer system comprising:

input means mounted to the aircraft for generating signals representative of real flight parameters, including the ambient altitude pressure, the total air temperature, the combined weight of the plane, cargo, fuel and passengers, and the actual mach of the aircraft;

computer means coupled to the input means and responding

to the real parameter signals received from the input means for producing output signals representing flight profile data for maximum fuel efficiency of the aircraft for the real parameters;

the computer means further produces signals corresponding to the theoretical and actual engine pressure ratios of the aircraft jet engine and produces a degraded performance factor signal proportional to the ratio of the actual and



theoretical engine pressure ratios as an indication of a degraded performance of the aircraft;

the computer means responds to the degraded performance factor signal to modify the output signals representing flight profile data for maximum fuel efficiency, taking into account the degrading performance of the aircraft; and

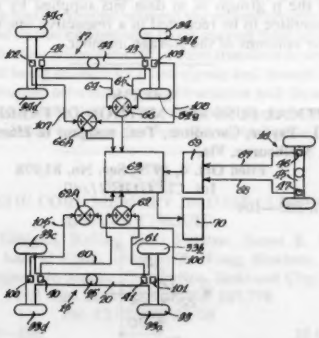
indicating means coupled to the computer means responsive to the output signals for displaying the flight profile data within the aircraft.

4,312,042

WEIGHT, BALANCE, AND TIRE PRESSURE DETECTION SYSTEMS

Charles D. Bateman, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Dec. 12, 1979, Ser. No. 102,776
Int. Cl.³ G01M *1/12*
U.S. Cl. 364—463 **31 Claims**



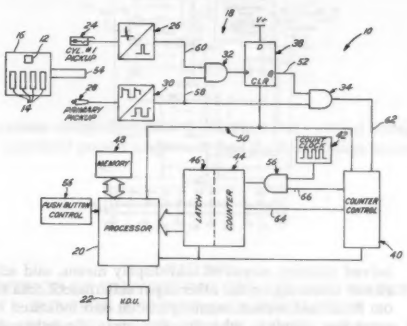
1. A weight measuring system for an aircraft having landing gear with a member which bends in response to aircraft weight comprising, a pair of inclinometers mounted to said member adjacent opposite ends thereof and each having a signal output representing the angle of the member with respect to a reference plane, and means for combining said signal outputs to generate a signal representative of aircraft weight on said member.

4,312,043

APPARATUS AND METHOD FOR DETERMINING THE INTEGRITY OF A DISTRIBUTOR FOR AN ENGINE

Howard Frank, Skokie; John W. Swafford, Jr., Glenview; Perry Farazi; Arvind M. Patel, both of Chicago; Cheuk-Wah Chan, Highland Park; Edward J. Dohnal, Chicago; Clark S. Wang, Elk Grove Village, and Ashokkumar D. Mehta, Des Plaines, all of Ill., assignors to Sun Electric Corporation, Crystal Lake, Ill.

Filed Mar. 21, 1980, Ser. No. 132,405
Int. Cl.³ G01R *13/42*
U.S. Cl. 364—551 **9 Claims**



1. An apparatus for determining the integrity of a distributor for an engine, said engine having a predetermined number of cylinders, a reference cylinder, and a crankshaft, comprising, in combination:

input means, responsive to operation of said engine and said distributor, for generating an input signal representing the time of firing of each of said cylinders after a first firing of said reference cylinder, the time between said first firing of said reference cylinder and the next firing thereof being the total firing time;

processor means, responsive to said input means, for receiving said input signal and determining therefrom the actual rotational position of said crankshaft at the time of firing of each of said cylinders, said processor means further determining, based upon said predetermined number of cylinders and said total firing time, the optimum rotational positions of said crankshaft for firing of said cylinders, respectively, said processor means further calculating the deviation between said actual rotational position and said optimum rotational position for each firing of said cylinders, said processor means generating a deviation signal representative of said deviation; and

display means for receiving said deviation signal and displaying a symbol in response thereto, said symbol being representative of said deviation.

4,312,044

TUNING APPARATUS

Michiru Baba, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Filed Feb. 6, 1979, Ser. No. 9,950
Claims priority, application Japan, Feb. 17, 1978, 53-17324; Feb. 17, 1978, 53-19267[U]; Feb. 17, 1978, 53-19268[U]
Int. Cl.³ G01R *23/00*; G10G *7/02*
U.S. Cl. 364—554 **2 Claims**

1. A tuning apparatus comprising circuit means for forming means deviation data and for updating said mean deviation data from instantaneous deviations of a measured sound frequency from a reference frequency, said circuit means comprises:

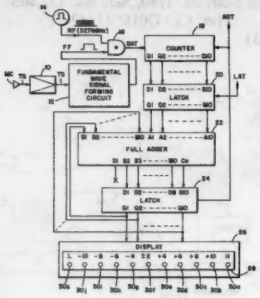
a counter circuit which provides instantaneous deviation data every fixed time interval,

a first memory circuit which temporarily stores the instantaneous deviation data from said counter circuit,

an adder circuit which receives data read out from said first memory circuit on one input side thereof,

means for halving an addition output from said adder circuit, and

a second memory circuit which temporarily stores the halved addition output for the purpose of indicating the



halved addition output of said display means, said adder circuit receiving on the other input side thereof data read out from said second memory circuit and indicated in a preceding display, whereby the mean deviation data which has been updated with the preceding display data and the instantaneous deviation data is derived from said second memory circuit; and

display means for visibly indicating said mean deviation data.

4,312,045

RECORDING CONTROL ARRANGEMENT FOR A DOT RECORDING MACHINE

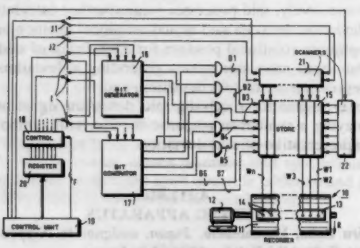
Eltgen Jean, Danjoutin, and Jossic Alain, Belfort, both of France, assignors to Compagnie Internationale Pour l'Informatique CII-Honeywell Bull, Paris, France

Filed Oct. 29, 1979, Ser. No. 89,039

Claims priority, application France, Dec. 6, 1978, 78 34415

Int. Cl.³ G06K *3/00*

U.S. Cl. 364—900 **6 Claims**



1. In a dot recording machine comprising a recording medium and at least a line of n recording units for recording dots on this medium, said line of recording units and said medium being moved relative to one another in a direction of movement perpendicular to said line, a control arrangement for controlling the recording on said medium of at least one combination of dots forming an image belonging either to a first series of given images, or to a second series of given images, each of the images in the first series being formed by dots lying within a matrix comprising m rows and p columns, with $n \geqq m \geqq p$, and each of the images in the second series being formed by dots lying within a matrix comprising p rows and m columns, each of the images in the said second series being identical to a respective one of the images in the first series, but being rotated through 90° from it, said control arrangement comprising:

a storage member comprising mn storage locations, each adapted to contain one data bit required to cause a dot to be recorded on the medium, said storage locations being disposed in m rows and n columns and each of said columns being connected to a respective one of the n recording units to enable the latter to receive the data bits which are extracted, row by row, from the said storage locations,

a first bit generator having km inputs and p outputs, k being a whole number, the said first bit generator being adapted to transmit a group of p data bits from its p outputs whenever one of its inputs is actuated, the p outputs of that first generator being connected to respective ones of the first p of the m rows of the storage member,

said first bit generator being operative in response to the actuation of m successive of its km inputs transmitting from its p outputs m groups of p data bits which, when stored in the storage member, are representative of an image in the first series,

a second bit generator having kp inputs and m outputs, the said second bit generator being adapted to transmit a group of m data bits from its m outputs whenever one of its inputs is actuated, the m outputs of that second generator being connected to respective ones of the m rows of the storage member,

said second bit generator being adapted for, in response to the actuation of p successive of its kp inputs, transmitting from its m outputs p groups of m data bits which, when stored in the storage member, are representative of an image in the second series,

and selecting and control means associated with said first and second generators and arranged to be set either to a first state or to a second state, said means being adapted on one hand, when they are set to their first state and when they receive a combination of signals representing in coded form an image to be formed on the medium, to energize m of the km inputs of the first generator and to cause each of the m groups of p data bits supplied by said generator to be recorded in a respective one of m successive columns of the storage member, and on the other hand, when they are set to their second state and when they receive the said combination of signals, to energize p of the kp inputs of the second generator and to cause each of the p groups of m data bits supplied by said second generator to be recorded in a respective one of p successive columns of the storage member.

4,312,046

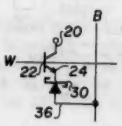
VERTICAL FUSE AND METHOD OF FABRICATION

David L. Taylor, Carrollton, Tex., assignor to Harris Corporation, Melbourne, Fla.

Filed Oct. 4, 1979, Ser. No. 81,978

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—104 **19 Claims**



1. A programmable read only memory array having a plurality of word lines and bits lines intersecting at a plurality of cells, each cell comprising:

a first semiconductor region of a first conductivity type;

a second semiconductor region of a second conductivity type formed in said first semiconductor region, said first and second semiconductor regions forming a first diode;

a third semiconductor region formed contiguous to said second semiconductor region having a shallow depth and having lateral dimensions smaller than the lateral dimensions of said second semiconductor region;

a bit line making contact with the top surface of said third semiconductor region;

a second diode being formed between said bit line and said second semiconductor region; and

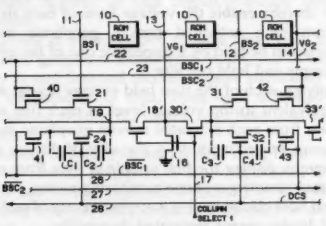
a word line making contact with the first semiconductor region a sufficient distance from said third semiconductor region such that atoms of said bit line will migrate through said third semiconductor region and form a verticle short between the bit line and said second semiconductor region when a sufficiently high voltage is placed across said bit and word lines without forming a lateral short.

4,312,047

MEMORY ARRAY HAVING IMPROVED ISOLATION BETWEEN SENSE LINES

William J. Donoghue, Round Rock, Tex., assignor to Motorola, Inc., Schaumberg, Ill.

Filed May 29, 1980, Ser. No. 154,353
Int. Cl.³ G11C *7/02*
U.S. Cl. 365—189 **8 Claims**



4. A memory array having a plurality of memory cells and having improved isolation between a first and a second sense lines, comprising: at least one return line which serves as a return line for two adjacent memory cells; at least one bit line coupled to one of the two adjacent memory cells; a first transistor coupled from the at least one return line to a node; a second transistor coupled to the node and to the at least one bit line; first blocking means coupled between the second transistor and the first sense line to substantially block current flow when the at least one bit line is non-selected; a third transistor coupled to the node and being enabled by a first signal; and second blocking means coupled between the third transistor and the second sense line wherein the first and second blocking means provide additional isolation between the first and second sense lines.

4,312,048

MAGNETIC CORE MEMORY INHIBIT CURRENT DRIVER CIRCUIT

Thomas J. Gilligan, Rolling Hills Estates; James E. Smith, Anaheim, both of Calif., and Yun P. Wong, Kowloon, Hong Kong, assignors to Ampex Corporation, Redwood City, Calif.

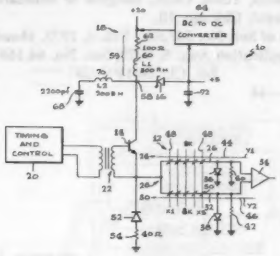
Filed Apr. 21, 1980, Ser. No. 141,776
Int. Cl.³ G11C *11/06*
U.S. Cl. 365—195 **10 Claims**

1. A core memory inhibit current driver circuit comprising:

a switch having a first terminal coupled to an inhibit conductor which inductively couples a plurality of magnetic memory cores and a second terminal coupled to a junction, the switch being selectively closed to pass inhibit current therethrough in response to a command signal;

a diode coupled between the junction and a first voltage source, the diode being oriented to conduct current in the direction of the inhibit current;

a storage capacitor coupled between the junction and a selected voltage;



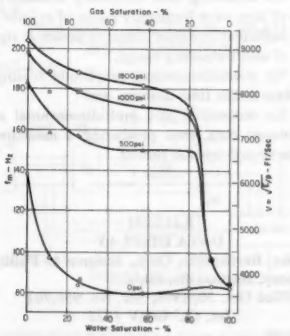
a resistor coupled between the junction and a second voltage source of greater magnitude than the first voltage source.

4,312,049

METHOD OF IDENTIFYING GAS, OIL AND WATER ZONES IN A SUBSURFACE FORMATION

Lucien Masse; W. Louis Medlin, both of Dallas, and James H. Sexton, Duncanville, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 29, 1979, Ser. No. 88,888
Int. Cl.³ G01V *1/40*
U.S. Cl. 367—35 **3 Claims**



1. A method for determining oil/water and gas/oil interfaces in subsurface formations comprising the steps of:

analyzing well bore formations to determine a hydrocarbon bearing formation having acoustic velocities that are maximum at high oil saturations, minimum at high water saturations and intermediate at high gas saturations to set predetermined acoustic velocity limits for water saturations, oil saturations and gas saturations;

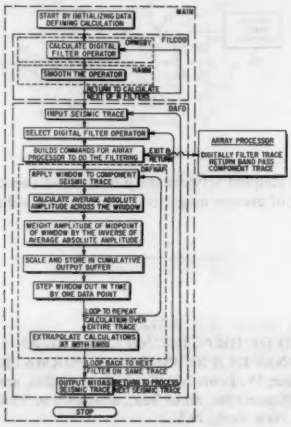
logging said hydrocarbon-bearing formations with a sonic logging system utilizing a frequency within the range of approximately 0.1 to 2 Kz to produce a sonic log having zones of different acoustic velocities;

identifying zones on said sonic log as hydrocarbon-bearing whenever said sonic log acoustic velocity exceeds said predetermined acoustic velocity limit for water saturations and identifying zones on said sonic log as oil bearing whenever said sonic log acoustic velocity exceeds said predetermined acoustic velocity limit for gas saturations.

4,312,050
MULTIDIMENSIONAL AMPLITUDE SCALING OF SEISMIC DATA

Robert C. Lucas, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 547,536, Feb. 6, 1975, abandoned. This application Aug. 6, 1979, Ser. No. 64,168
Int. Cl.[3] G01V *1/28*
U.S. Cl. 367—44 17 Claims


MAIN
START BY INITIALIZING DATA DEFINING CALCULATION
CALCULATE DIGITAL FILTER OPERATOR
FILCOD
SMOOTH THE OPERATOR
RANM
REPEAT TO CALCULATE NEXT OF N FILTERS
DATD
INPUT SEISMIC TRACE
SELECT DIGITAL FILTER OPERATOR
BUILDS COMMANDS FOR ARRAY PROCESSOR TO DO THE FILTERING
EXT & RETURN
APPLY WINDOW TO COMPONENT SEISMIC TRACE
DWIND
CALCULATE AVERAGE ABSOLUTE AMPLITUDE ACROSS THE WINDOW
WEIGHT AMPLITUDE OF MIDPOINT OF WINDOW BY THE INVERSE OF AVERAGE ABSOLUTE AMPLITUDE
SCALE AND STORE IN CUMULATIVE OUTPUT BUFFER
STEP WINDOW OUT IN TIME BY ONE DATA POINT
LOOP TO REPEAT CALCULATION OVER ENTIRE TRACE
EXTRAPOLATE CALCULATIONS AT BOTH ENDS
LOOP BACK TO NEXT FILTER ON SAME TRACE
OUTPUT WINDOWED SEISMIC TRACE
RETURN TO PROCESS NEXT SEISMIC TRACE
STOP
ARRAY PROCESSOR
DIGITALLY FILTER TRACE
RETURN BAND PASS COMPONENT TRACE

17. An apparatus for improving seismic resolution comprising:

(a) means for detecting and recording seismic data as a function of time over frequency range of at least 20 to 100 Hz with sufficient dynamic range to preserve signal components of said frequency range,

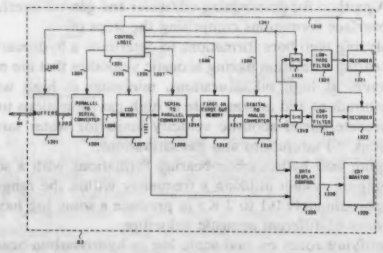
(b) means for multidimensional amplitude scaling of said seismic data in the time domain, and

(c) means for outputting said multidimensional amplitude scaled seismic data, thus producing a multidimensional amplitude scaled seismic record.

4,312,051
DATA DISPLAY

Terry A. Miller, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 30, 1978, Ser. No. 955,902
Int. Cl.[3] G01V *1/22*
U.S. Cl. 367—68 8 Claims



1. A method for performing a seismic geophysical survey wherein a central control means is utilized to control and acquire data from a plurality of remote geophone monitoring means, each of said remote geophone monitoring means being adapted to receive analog electrical signals from at least one geophone means, comprising the steps of:

activating at least one of said plurality of remote geophone monitoring means;

providing electrical signals, representative of seismic waves, from at least one of a plurality of geophone means to a respective one of each activated remote geophone monitoring means, each activated remote geophone monitoring means performing preselected data processing operations on said analog electrical signals, said preselected data processing operations comprising:

sampling said analog electrical signals; and

converting the thus sampled analog electrical signals from analog form to digital form;

transmitting the sampled electrical signals, which have been converted to digital form, as seismic data to said central control means;

storing said seismic data in a memory; and

displaying the seismic data from each one of the activated remote geophone monitoring means, said step of displaying the seismic data from each one of said activated remote geophone monitoring means comprising the steps of:

supplying a first sample of data, from each activated remote geophone monitoring means, from said memory to respective ones of a plurality of sample and hold circuits to thereby enable the voltage level of each first sample from each activated remote geophone monitoring means to be held by a respective one of the plurality of sample and hold circuits;

supplying each of the thus held voltage levels, which are equivalent to the voltage level of each first sample of data from each activated remote geophone monitoring means respectively, to a plurality of display means to thereby display the first sample of data from each activated remote geophone monitoring means, each sample and hold circuit having a respective one of said plurality of display means associated therewith;

supplying a second sample of data, from each activated remote geophone monitoring means, from said memory to respective ones of said plurality of sample and hold circuits to thereby enable the voltage level of each second sample of data from each activated remote geophone monitoring means to be held by a respective one of said plurality of sample and hold circuits;

supplying each of the thus held voltage levels, which are now equivalent to the voltage level of each second sample of data from each activated remote geophone monitoring means respectively, to said plurality of display means to thereby display the second sample of data from each activated remote geophone monitoring means;

continuing to supply samples of data, from each activated remote geophone monitoring means, sequentially from said memory means to respective ones of said plurality of sample and hold circuits to thereby enable the voltage level of each sample from each activated remote geophone monitoring means to be sequentially held by a respective one of said plurality of sample and hold circuits; and

supplying each of the thus held voltage levels, which will be equivalent to the voltage level of the sequential samples of data from each activated remote geophone monitoring means respectively, to said plurality of display means to thereby display the samples of data from each activated remote geophone monitoring means sequentially, wherein said step of supplying samples of data from said memory to respective ones of said plurality of sample and hold circuits comprises:

reading a first sample of data, from each activated remote geophone monitoring means, out of said memory to a first register;

reading a second sample of data, from each activated

remote geophone monitoring means, out of said memory to a second register;

reading the first sample of data, from each activated remote geophone monitoring means, out of said first register to a digital-to-analog conversion system to therein convert the first samples of data, from each activated remote geophone monitoring means, from digital form to analog form before the first samples, from each activated remote geophone monitoring means, are supplied to the respective ones of said plurality of sample and hold circuits;

reading the second sample of data, from each activated remote geophone monitoring means, out of said second register to said digital-to-analog conversion system after the first sample of data, from each activated remote geophone monitoring means, has been supplied to said plurality of sample and hold circuits, to therein convert the second sample of data, from each activated remote geophone monitoring means, from digital form to analog form;

supplying the second sample of data, from each activated remote geophone monitoring means, from said digital to analog conversion system to said plurality of sample and hold circuits;

reading a third sample of data, from each activated remote geophone monitoring means, out of said memory to said first register while data is being supplied from said second register to said digital-to-analog conversion system;

continuing to read samples of data, from each activated remote geophone monitoring means, out of said memory to said first and second register alternately until all of the samples of data, from each activated remote geophone monitoring means, have been read out of said memory;

continuing to supply the samples of data, from each activated remote geophone monitoring means, from said first and second registers alternately to said digital-to-analog conversion system with samples of data, from each activated remote geophone monitoring means, being read out of said memory to the one of said first and second registers which is empty as the data is being supplied from the full register to the digital-to-analog conversion system; and

continuing to supply the samples of data, from each activated remote geophone monitoring means, from said digital-to-analog conversion system to said plurality of sample and hold circuits and wherein selecting the respective one of said plurality of sample and hold circuits to which it is desired to provide samples from a particular activated remote geophone monitoring means comprises the steps of:

presetting a counter to the number of activated remote geophone monitoring means; and

decoding the output of said counter to thereby select a desired one of said plurality of sample and hold circuits to which it is desired to supply the samples from a particular activated remote geophone monitoring means.

4,312,052

METHOD FOR IDENTIFYING WEAK SANDS

Charles B. Vogel, Houston, and Robert A. Herolz, Willis, both of Tex., assignors to Shell Oil Company, Houston, Tex.

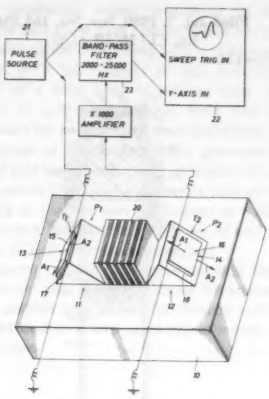
Filed Apr. 21, 1980, Ser. No. 141,835
Int. Cl.³ G01V *1/047, 1/053, 1/40*
U.S. Cl. 367—75 **9 Claims**

1. An apparatus for measuring characteristics of SV shear waves in an earth material comprising:

a pair of prisms formed of a low shear velocity material, said prisms being disposed on a flat surface of said earth material in spaced positions;

a transducer mounted on each prism, one of said transducers being mounted to produce SV shear waves in one of said prisms and the other transducer being mounted to receive the SV shear waves;

filter means coupled to said other transducer to reject low



frequency noise and high frequency compressional waves; and

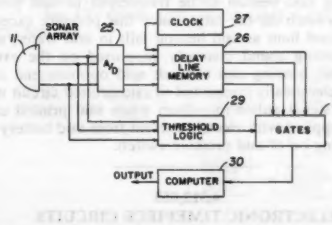
recording means coupled to said filter to record the SV shear waves received by said other transducer.

4,312,053

RANGE AND DEPTH DETECTION SYSTEM

Alan H. Lipsky, Flushing, N.Y., assignor to Subcom, Inc., Glen Cove, N.Y.

Filed Dec. 3, 1971, Ser. No. 204,574
Int. Cl.³ G01S *5/18*
U.S. Cl. 367—127 **7 Claims**



1. The method of determining from a monitoring point the range to and the depth of a submerged object from which pulses of acoustic energy may be received wherein mathematical formulations interrelating angle of arrival, range and depth are solved to obtain said quantities of range and depth, said method comprising the steps of:

(a) detecting the vertical angle versus time sequence associated with the multipaths of a particular pulse of acoustic energy emanating from said submerged object;

(b) examining the time sequence with respect to said multipath pulses so as to determine those multipath pulses that do not overlap as to their time of arrival at said monitoring point;

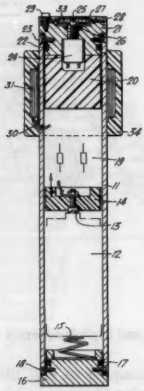
(c) determining said angles of arrival associated with said nonoverlapping multipath pulses; and

(d) solving said mathematical formulations for the said quantities of range and depth by substitution therein of said angles of arrival associated with said nonoverlapping multipath pulses.

4,312,054
ACOUSTIC BEACONS

Bard Holand, Trondheim, Norway, assignor to SINTEF (Selskapet for industriell og teknisk forskning ved NTH), Trondheim, Norway

Filed Jul. 7, 1980, Ser. No. 166,554
Int. Cl.³ H04B *11/00*
U.S. Cl. 367—134 2 Claims



1. Acoustic beacon suitable for use on a boat and arranged to operate only if the boat is submerged which comprises a pipe-shaped housing spring-loadedly receiving a battery between a first end plug sealingly engaging internal walls of said housing at one end of the latter and contact means, printed circuit means disposed between said contact means and a second end plug sealingly engaging internal walls of said housing at the opposite end of said housing, a pressure switch arranged in and projecting outwardly from said second end plug, a membrane clamped against said second end plug adjacently outward of said pressure switch and allowing the pressure from water surrounding said beacon to be transferred to said pressure switch to switch on the latter once this pressure exceeds a predetermined limit as said beacon falls in said water, means for transmitting sound coaxially supported on the external walls of said housing and towards said opposite end of the latter and electrically connected to said printed circuit means to receive signal pulses therefrom when said printed circuit means is supplied with electric current from said battery with the switching on of said pressure switch.

4,312,055
ELECTRONIC TIMEPIECE CIRCUITS

Robert T. Noble, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

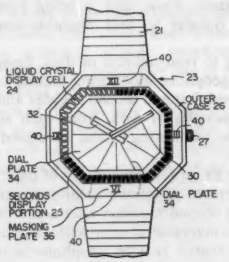
Division of Ser. No. 877,192, Feb. 13, 1978, Pat. No. 4,209,974.
This application Feb. 25, 1980, Ser. No. 124,013
Int. Cl.³ G04B *19/24;* G04C *19/00, 17/00*
U.S. Cl. 368—29 7 Claims

1. An electronic analog horological display having representations of a central hub, a first bar extending radially from said hub and representing minutes and a second bar extending radially from said hub and representing hours, said second bar being substantially shorter in length than said first bar, means effective when said display is displaying ordinary time to cause said second bar to appear substantially wider than said first bar, and means effective when said display is being set to cause said second bar to retain its substantially wider appearance when time is being displayed as PM and to change its appearance to that of essentially the width of said first bar when time is being displayed as AM.

4,312,056
COMPOSITE DISPLAY TYPE ELECTRONIC TIMEPIECE

Katsuo Nishimura, Tokorozawa, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Jan. 8, 1980, Ser. No. 110,309
Claims priority, application Japan, Jan. 17, 1979, 54-4254; Jan. 17, 1979, 54-4257; May 11, 1979, 54-56973; Aug. 31, 1979, 54-111299
Int. Cl.³ G04B *19/22, 19/24, 19/04*
U.S. Cl. 368—62 10 Claims



1. An electronic timepiece comprising, in combination:
time indicating hands for providing a display of at least hours and minutes of time information;
an electro-optical display cell having a central aperture and a group of display elements arranged in a ring configuration around said time indicating hands to provide a display of data other than said time information; and
an analog module including drive shafts extending through said central aperture of said electro-optical display cell and drivably connected to said time indicating hands to drive said time indicating hands, in which said analog module comprises a supporting plate serving as a circuit substrate having its one surface formed with a printed circuit pattern, and electrically conductive rubber means disposed between said electro-optical display cell and said circuit substrate to provide an electrical connection between said display cell and said printed circuit pattern;
at least a portion of said analog module being accommodated in the central aperture of said electro-optical display cell.

4,312,057
ELECTRONIC TIMEPIECE PROVIDING AUDIBLE AND VISIBLE TIME INDICATIONS

Kazunari Kume, Tokorozawa, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Dec. 6, 1978, Ser. No. 966,917
Claims priority, application Japan, Dec. 12, 1977, 52-149112
Int. Cl.³ G04B *21/08*
U.S. Cl. 368—63 13 Claims

1. An electronic timepiece for providing audible and visible time indications, comprising:

a standard frequency oscillator circuit for producing a standard high frequency signal;

frequency divider circuit means for dividing the frequency of said standard high frequency signal to provide low frequency signals including a time unit signal and a basic timing signal;

time counter circuit means responsive to said time unit signal for producing information indicative of current time;

display means for visibly displaying said current time information;

an externally actuatable switch responsive to actuation thereof for producing a switching signal;

storage means responsive to said switching signal for storing said current time information;

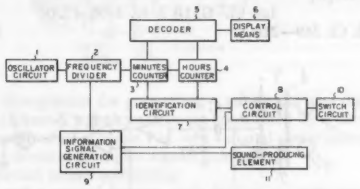
first discrimination circuit means responsive to said current time information stored in said storage means for providing a signal representing a numeric value indicative of a time zone of said current time information;

second discrimination means responsive to said current time information stored in said storage means for providing a signal representing a numeric value indicative of a time unit of said current time information;

first electronic switch means responsive to said switching signal for transferring said basic timing signal to an output thereof;

first counter circuit means for counting said basic timing signal applied thereto from said output of said first electronic switch means;

first gate circuit means responsive to output signals from said first counter circuit means and said signal from said first discrimination means for detecting coincidence between a



count in said first counter circuit means and said numeric value indicative of a time zone, and for producing an output signal when such coincidence is detected, said output signal being applied to said first electronic switch means to inhibit signal transfer thereby and to said first counter circuit means for resetting the count therein to a predetermined initial value;

second electronic switch means responsive to said output signal from said first gate circuit means for transferring said basic timing signal to an output thereof;

second counter circuit means for counting said basic timing signal applied thereto from said output of said second electronic switch means;

second gate circuit means responsive to output signals from said second counter circuit means and to said signal from said second discrimination circuit means for detecting coincidence between a count in said second counter circuit means and said numeric value indicative of a current time unit and for producing an output signal when such coincidence is detected, said output signal being applied to said second electronic switch means to inhibit signal transfer thereby and to said second counter circuit means for resetting the count thereof to a predetermined initial value;

third gate circuit means responsive to output signals from said first counter circuit means for producing a control signal having a duration proportional to a maximum count value attained by said first counter circuit means, said duration being zero or an integral number of periods of said basic timing signal;

fourth gate circuit means responsive to output signals from said second counter circuit means for producing a control signal having a duration proportional to a maximum count value attained by said second counter circuit means, said duration being zero or an integral number of periods of said basic timing signal;

tone signal producing means responsive to said control signal from said third gate circuit means for producing a time division signal comprising bursts of tone sequentially generated, with the number of said tone bursts being indicative of a time zone of current time, and further responsive to said control signal from said fourth gate circuit means for producing a time indication signal comprising bursts of tone sequentially generated, with the number of said tone bursts being indicative of a number of units of current time, said tone bursts indicative of a time zone being at least in part modulated at a different frequency from a modulation frequency of said tone bursts indicative of units of current time; and

sound producing means responsive to said time division signal and said time indication signal for producing corresponding audible tone bursts, for thereby audible indicating current time as a time zone and as a time unit within that time zone.

4,312,058

ELECTRONIC WATCH

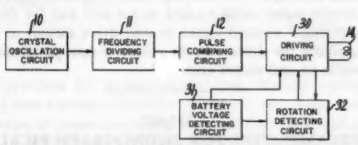
Masaharu Shida; Akira Torisawa, and Makoto Ueda, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Apr. 20, 1978, Ser. No. 898,397

Claims priority, application Japan, Apr. 23, 1977, 52-047096

Int. Cl.³ G04B *9/00, 19/04;* G04F *5/00*

U.S. Cl. 368—66 **8 Claims**

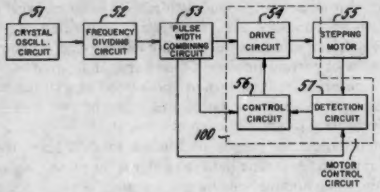


1. An electronic timepiece powered by a battery comprising: a stepping motor; an oscillating circuit for producing a time standard signal; a dividing circuit for dividing the time standard signal; a pulse combining circuit for combining the divided signals to produce normal drive pulses having a given pulse width and wider drive pulses having a pulse width wider than the given pulse width; a driving circuit for normally driving the motor with the normal drive pulses; a rotation detecting circuit for detecting rotation and non-rotation of the motor after the application of each of the normal drive pulses to the motor; a battery voltage detecting circuit for detecting when the voltage of the timepiece battery drops to a predetermined low voltage condition indicative of the approaching exhaustion of the timepiece battery; and means responsive to detection of a low voltage condition for inhibiting the operation of the rotation detecting circuit and for controlling the driving circuit to apply the wider drive pulses instead of the normal drive pulses to the motor for the duration of the low voltage condition.

4,312,059
ELECTRONIC TIMEPIECE

Masaaki Mandai; Akira Torisawa; Makoto Ueda; Kazuhiro Asano; Masaharu Shida, and Katsuhiko Satoh, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Apr. 20, 1978, Ser. No. 898,439
Claims priority, application Japan, Apr. 23, 1977, 52-47088
Int. Cl.³ G04F *5/00*; G04C *19/00*; G05B *19/40*
U.S. Cl. 368—157 **22 Claims**

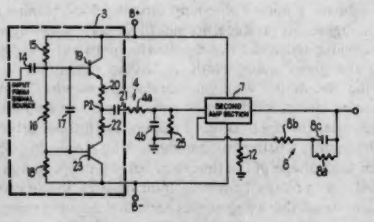


1. In an electronic timepiece:
an oscillator circuit for generating a periodic time standard signal;
pulse generating means receptive of the periodic time standard signal for dividing the same and for generating pulse output signals;
a stepping motor having a rotor, a stator and a coil;
a drive circuit responsive to one of the pule output signals from said pulse generating means and responsive to control signals for normally applying driving current pulses of a particular pulse width to the coil of said stepping motor for driving said rotor;
detecting means for applying a detection pulse to the coil of said stepping motor after a driving current pulse has been applied to said coil and for sensing a coil current in response to the applied detection pulse to determine whether or not said rotor had rotated in response to the previously applied driving current pulse; and
control means cooperative with said detecting means and receptive of the pulse output signals from said pulse generating means for applying a control signal to said drive circuit to control said drive circuit to apply a correction pulse having a pulse width greater than that of the driving current pulse width to said motor coil and for thereafter applying a control signal to said drive circuit to resume applying the drive current pulses of said particular pulse width to said motor coil.

4,312,060
PREAMPLIFIER FOR PHONOGRAPH PICKUP

Robert Grodinsky, 4448 W. Howard St., Skokie, Ill. 60076

Filed Apr. 26, 1979, Ser. No. 33,380
Int. Cl.³ G11B *3/00, 3/74*; H03F *3/04*
U.S. Cl. 369—134 **14 Claims**

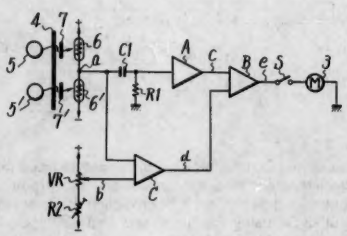


1. A preamplifier for a magnetic phonograph record pickup, said preamplifier comprising: phonograph pickup signal input terminal means to which the pickup output signals are to be applied; an input section which is devoid of any multiple stage negative feedback amplifiers, said input section having input terminal means coupled to said phonograph pickup input terminal means and output terminal means, said input section having a bandwidth with an upper limit of at least about 30 KHz; a second section, said second section including a multiple stage negative feedback amplifier with a negative feedback circuit around more than one stage thereof, said second section providing amplification of the signals fed to the input thereof and having a bandwidth which accommodates at least audio frequency signals; high frequency roll-off RIAA compensation network means coupled between said output terminal means of said input section of the preamplifier and the input of said second section, whereby said second section receives reduced amounts of said frequency components which fall substantially above 20 KHz; and low frequency boost RIAA compensation network means as part of said negative feedback circuit for boosting relatively low frequencies in the audio frequency range.

4,312,061
RECORD PLAYER

Hideaki Hayashi, Mitaka, Japan, assignor to Nippon Columbia Kabushikikaisha, Tokyo, Japan

Filed Jun. 15, 1979, Ser. No. 48,894
Claims priority, application Japan, Jul. 6, 1978, 53-82226; Jul. 6, 1978, 53-82227; Aug. 31, 1978, 53-106606; Oct. 5, 1978, 53-137119[U]
Int. Cl.³ G11B *3/10, 3/08, 17/06*
U.S. Cl. 369—216 **12 Claims**



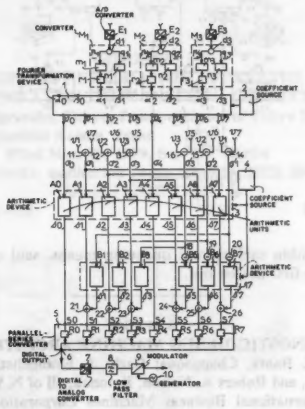
1. A record player comprising:
(a) a tone arm;
(b) drive means for selectively moving said tone arm in a horizontal and a vertical direction;
(c) detecting means for sensing a position of said tone arm in the horizontal direction and producing a voltage corresponding to the position of said tone arm;
(d) a voltage source having first and second terminals;
(e) voltage regulating means connected between said first and second terminals of the voltage source for producing a reference voltage corresponding to a desired position, said voltage regulating means having manual operable means for selectively varying said reference voltage;
(f) first comparing means for comparing the voltage from said detecting means with the reference voltage from said voltage regulating means; and
(g) speed signal generating means for receiving the voltage from said detecting means and producing a speed signal;
(h) second comparing means for comparing the voltage from said first comparing means with the speed signal and producing a compared signal; and
(i) means for applying the compared signal from said second comparing means to said drive means to move said tone arm in said horizontal direction.

4,312,062

SYSTEM FOR DIGITALLY CONVERTING BASEBAND CHANNEL SIGNALS INTO A FREQUENCY-DIVISION MULTIPLEX SIGNAL AND VICE VERSA

Maurice G. Bellanger, Antony, and Jacques L. Daguet, St. Maur des Fosses, both of France, assignors to Telecommunications Radioelectriques et Telephoniques, Paris, France

Filed Jun. 20, 1975, Ser. No. 588,854
Claims priority, application France, Jun. 28, 1974, 74 22641
The portion of the term of this patent subsequent to Nov. 19, 1995, has been disclaimed.
Int. Cl.³ H04J 1/00
U.S. Cl. 370—50 5 Claims



1. An arrangement for converting a number of real digital base band channel signals each being constituted by a succession of components at a rate $2\Delta f$, into a digital single sideband frequency-division multiplex signal, comprising:

input circuit means comprising:

a first and a second branch, each having an input and an output, one of said branches including a delay circuit;

means for selectively applying the components of the digital channel signal applied to said input circuit means to the input of said first and to the input of said second branch, to produce pairs of digital signals;

a Fourier transformation device which is provided with N pairs of inputs and with 2 N outputs, where N is at least equal to the number of base band channel signals, and wherein said outputs being symmetrical; means for applying said pairs of digital signals to selected ones of said N pairs of inputs of said Fourier transformation device;

a first coefficient source which supplies carrier signal functions to said Fourier transformation device;

a plurality of at least $N-1$ addition circuits, each receiving symmetrical outputs of said Fourier transformation device and producing sum signals σ_k wherein $k=1, 2, \ldots N-1$;

a plurality of at least $N-1$ subtraction circuits, each receiving symmetrical outputs of said Fourier transformation device and producing difference signals σ'_k;

a plurality of first digital low pass filters A_i wherein $i=1, 2, \ldots 2N-1$, producing first filter output signals s_i in response to filter input signals, the sum signals σ_k acting as filter input signals for the low pass filters A_k and A_{2N-k};

a plurality of second digital low pass filters B_i wherein $i=1, 2, \ldots 2N-1$, producing second filter output signals s'_i in response to filter input signals, the difference signals σ'_k acting as filter input signals for the low pass filters B_k and B_{2N-k};

means for summing first and second filter output signals to produce digital auxiliary sum signals $S_i=s_i+s'_i$;

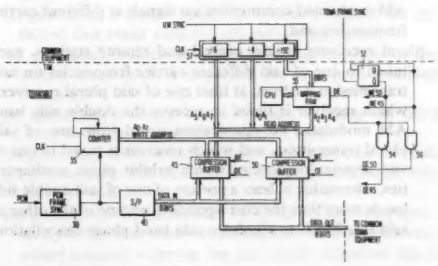
a parallel to series converter having at least 2 N parallel arranged inputs which are adapted to receive the auxiliary sum signals S_i for producing an output digital signal which is an interleaved version of the said digital auxiliary sum signals S_i and which corresponds to the desired multiplex signal; a second coefficient source which supplies a set of filter coefficients a(q) wherein $q=-2NP, -2NP+1, \ldots -1, 0, 1, 2, \ldots 2NP-1$ and wherein P is some positive integer, said filter coefficients a(q) defining samples of the impulse response of a low pass filter having a cutoff frequency which is equal to $\Delta f/2$, said samples being taken at a rate $2N\ \Delta f$, the filter coefficients $a(i-2Nr)$ wherein $r=-P, -P+1, \ldots -1, 0, 1, 2, \ldots P-1$, of said set of filter coefficients being applied to the low pass filters A_i and $B_{(N+i) modulo\ 2N}$.

4,312,063

TDM DATA REORGANIZATION APPARATUS

Brady Warner, Santa Maria, Calif., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Sep. 27, 1979, Ser. No. 79,601
Int. Cl.³ H04Q 11/04; H04J 3/02
U.S. Cl. 370—68 7 Claims



1. Apparatus for re-sequencing time division multiplexed (TDM) data having a plurality of frames, each frame comprising a series of consecutive data words delivered to said apparatus at a specified rate, each data word representing one of a plurality of data channels being interleaved within said frames, said apparatus comprising:

a memory means having said TDM data applied to data input lines and having write address selection lines, read address selection lines, and data output lines;

counting means counting at said specified rate and having a plurality of address bit outputs for applying a first sequence of addresses to said write address selection lines when said TDM data is written into said memory means and for applying a second sequence of addresses to said read address selection lines when said TDM data is read out of said memory means, said counting means including at least first and second counting subsections with said first counting subsection counting at a first rate and indicating to which of said plurality of frames each said data word belongs;

said first and second sequences being different from one another whereby said read out TDM data is reorganized so as to place a plurality of data words representing a single data channel into a contiguous block of time.

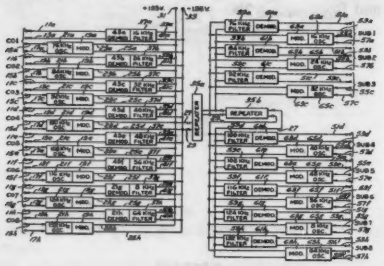
4,312,064
MODIFIED VESTIGIAL SIDE BAND TRANSMISSION SYSTEM

Stephen M. Bench, Huntington Beach; Paul H. Thibodeau, Stanton; Guy M. Campbell, Corona, and Theodore M. Stump, Costa Mesa, all of Calif., assignors to The Anaconda Company, Denver, Colo.

Continuation-in-part of Ser. No. 7,666, Jan. 29, 1979, abandoned. This application Jan. 25, 1980, Ser. No. 115,378

Int. Cl.³ H04J *1/06, 1/12, 1/18*

U.S. Cl. 370—71 **41 Claims**



1. A telephone transmission system providing multiple modulated carrier communication channels between a single central station and plural remote stations on a single transmission medium which exhibits phase nonlinearities at certain frequencies, comprising:

plural transmitters at said central and remote stations, each generating on said transmission medium double side band AM modulated communication signals at different carrier frequencies; and

plural receivers at said central and remote stations, each tuned to one of said different carrier frequencies on said transmission medium, at least one of said plural receivers, which receiver is tuned to receive the double side band AM modulated communication signal from one of said plural transmitters, and which receiver is tuned to one of said certain frequencies which exhibit phase nonlinearities, attenuating at least a portion of one of said double side bands more than the corresponding portion of the other of said side bands to eliminate side band phase cancellation.

4,312,065
TRANSPARENT INTELLIGENT NETWORK FOR DATA AND VOICE

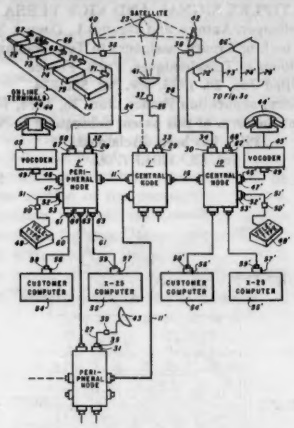
Mehmet E. Ulug, Ottawa, Canada, assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 912,160, Jun. 2, 1978, abandoned. This application May 15, 1980, Ser. No. 150,264

Int. Cl.³ H04J *6/00*

U.S. Cl. 370—94 **7 Claims**

1. In a communications network for data and voice having a first node and a second node interconnected with said first node, said first node having a first plurality of customers connected thereto and said second node having a second plurality connected thereto, the improvement comprising first queueing means and second queueing means in said first node, means including said first queueing means for receiving and processing continuing overflows of input signals from those of said first plurality of customers whose signals have been accepted into the network, and means including said second queueing means for accepting initial signals from customers requesting entry into the network in order and according to available



space within said second queueing means, said order being selective first in-first out.

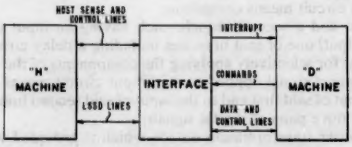
4,312,066
DIAGNOSTIC/DEBUG MACHINE ARCHITECTURE

David F. Bantz, Chappaqua; Carlo J. Evangelisti, Jefferson Valley, and Robert A. Nelson, Katonah, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1979, Ser. No. 107,992

Int. Cl.³ G06F *11/22*

U.S. Cl. 371—16 **10 Claims**



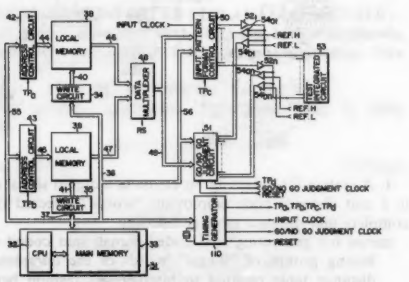
1. A Diagnostic/Debug computing system for use with a Host computer (H-machine) incorporating the LSSD design concept, said LSSD design including the provision of LSSD registers incorporated in predetermined functional units of said H-machine, said Host computer having an external interface including a LSSD input line, a LSSD output line, a LSSD shift line, output lines for indicating the end of predetermined operational sequences within the H-machine, and a "run CPU" input line which must be supplied with a predetermined signal in order for the H-machine to run, all of said lines being connected to said external interface, said Diagnostic/Debug computing system comprising an interface unit and a processing unit (D-machine) said interface unit being interposed between said H-machine external interface and a similar interface in said D-machine in data exchange relationship with both, said interface unit including first register means for initially receiving state data via the LSSD output line from the H-machine external interface to be transferred to said D-machine for diagnostic purposes and second register means connected to the LSSD input line of the H-machine external interface for receiving state data from the D-machine to be stored in predetermined locations in the LSSD registers of said H-machine, control means within said interface unit actuable by said D-machine to cause state data to be selectively transferred between said H-machine and D-machine via said register means,

said D-machine including programmable control means for effecting the execution of predetermined diagnostic programs therein which require the access of state data from and the transfer of state data to the H-machine at predetermined times during the operating cycle of said H-machine, said programmable control means in said D-machine further including means for specifying to the interface unit and H-machine when said state data is to be transferred between the LSSD registers in the H-machine and storage means located in said D-machine and in which direction.

4,312,067
FUNCTION TEST EVALUATION APPARATUS FOR EVALUATING A FUNCTION TEST OF A LOGIC CIRCUIT

Hisatoshi Shirasaka, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Nov. 29, 1979, Ser. No. 98,694
Claims priority, application Japan, Dec. 23, 1978, 53-160705
Int. Cl.³ G01R *31/28*
U.S. Cl. 371—25 **3 Claims**



1. An apparatus for evaluating the proper functioning of a logic circuit comprising:

a control section including a central processing element for performing control functions and a main memory in data communication with said control processing element for storing test information and expected value information, said test information to be inputted to said logic circuit being evaluated and said expected value information to be compared to data outputted from said logic circuit to determine whether said logic circuit is operating properly;

a plurality of memory means for storing said input test information and the expected value information from said main memory;

a plurality of write circuits connected between said control section and said plurality of memory means for writing the test information from said main memory into said plurality of memory means;

a plurality of address circuits connected between said control system and said plurality of memory means for supplying addresses to said memory means;

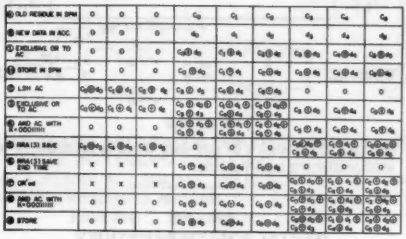
a pattern format control circuit for time-shaping test information received from said plurality of memory means and for sending said time-shaped test information to said logic circuit being evaluated; and

a judgement circuit for comparing data outputted from said logic circuit being evaluated with the expected value information to determine if said logic circuit is operating properly, said expected value information being received by said judgement circuit from said plurality of memory means.

4,312,068
PARALLEL GENERATION OF SERIAL CYCLIC REDUNDANCY CHECK

Gary J. Goss, Acton, and Robert C. Miller, Braintree, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 714,074, Aug. 12, 1976, abandoned.
This application Mar. 7, 1978, Ser. No. 884,465
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—37 **26 Claims**



1. The method of generating a cyclic redundant check character in a general purpose computer comprising:

(a) generating a first result by exclusive OR'ing with a previously generated cyclic redundant check character, the new data for which a cyclic redundant check character is to be generated;

(b) left shifting the first result by a predetermined number of bits;

(c) generating a second result by exclusive OR'ing the unshifted first result with the left shifted first result;

(d) generating a third result by AND'ing each bit of the second result with a respective bit in a predetermined constant;

(e) generating a fourth result by right rotating the third result by a predetermined number of bits;

(f) generating a fifth result by right rotating the fourth result;

(g) generating a sixth result by OR'ing the fourth result with the sixth result;

(h) generating a seventh result by AND'ing each bit respectively of the sixth result with a respective bit of a predetermined constant whereby the new cyclic redundant check character is generated.

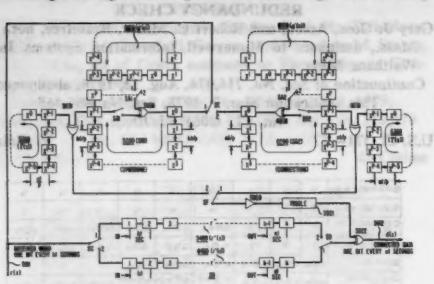
4,312,069
SERIAL ENCODING-DECODING FOR CYCLIC BLOCK CODES

Syed V. Ahamed, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 7, 1980, Ser. No. 119,420
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—37 **15 Claims**

1. An encoder for generating a cyclically encoded n-bit channel word from an incoming k-bit data word, said encoder comprising serial shift and divide means for generating p parity bits, and wherein said encoder is further characterized by

shift register means partitioned into a parallel arrangement of register segments of predetermined lengths for storing



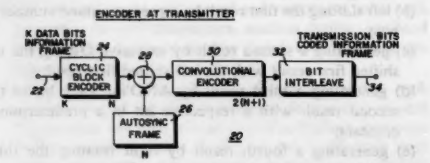
bits (p+1) through k of said data word in accordance with said predetermined lengths.

4,312,070

DIGITAL ENCODER-DECODER

Daniel J. Coombes, Winfield, and Martin V. Seitz, Fox River Grove, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 7, 1979, Ser. No. 101,345
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—40 **10 Claims**



1. In a data communications system for the transmission and reception of a data bit stream, the improvement comprising:

an encoder for receiving information and processing said information into the data bit stream to be transmitted, said encoder comprising;

cyclic block encoder means for receiving information and producing an error detectable encoded bit stream corresponding thereto;

encoder storage means having a predetermined autosynchronization sequence stored therein; said autosynchronization sequence selected to optimize, at a decoder, the generation of errors during an out-of-synchronization condition to enable determination of out-of-synchronization conditions between said encoder and decoder;

encoder combining means for combining said autosynchronization bits from the encoder storage means with the bit stream from said cyclic block encoder means to produce a concatenated bit stream; and

convolutional encoder means for receiving said concatenated bit stream from the encoder combining means and producing an error correctable encoded data bit stream corresponding thereto; and

a decoder for receiving and processing said data bit stream to recover said information, said decoder comprising;

convolutional decoder means for receiving said data bit stream and producing an error corrected bit stream;

decoder storage means having a predetermined sequence of autosynchronization bits stored therein, the predetermined sequence of autosynchronization bits corresponding to the autosynchronization bits stored in said encoder storage means;

decoder combining means for combining said error corrected bit stream from the convolutional decoder means with said autosynchronization bit sequence from the decoder storage means and to provide a block encoded bit stream; and

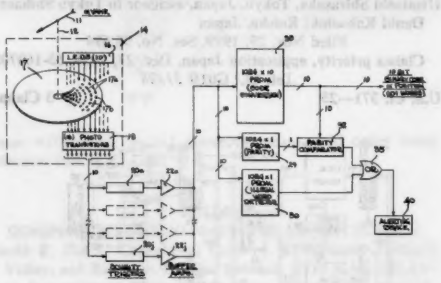
cyclic block decoder means for decoding said block encoded bit stream to recover said information, said cyclic block decoder means further producing an output indicating the presence of errors in the recovered data bit stream when said decoder is in synchronization with said encoder.

4,312,071

DIGITAL CODE ERROR DETECTION AND ALERTING SYSTEM

Ramon Bloch, Yonkers, N.Y., assignor to Safe Flight Instrument Corporation, White Plains, N.Y.

Filed Dec. 3, 1979, Ser. No. 99,903
Int. Cl.³ G06F *11/12*
U.S. Cl. 371—57 **8 Claims**



1. A system for detecting bit errors in a digital signal coded in a unit distance code employing "words" selected from a complete unit distance table comprising

means for generating said coded signal, said coded signal having groups of "illegal" words of the complete unit distance table omitted in interspersed fashion between groups of "legal" words in said table which are used,

a programmed ROM connected to receive the coded signal from said generating means, said ROM being programmed to generate a predetermined output signal whenever it is addressed by "illegal" words, and

alerting means connected to said ROM to receive said predetermined output signal for generating an alerting signal in response thereto.

4,312,072

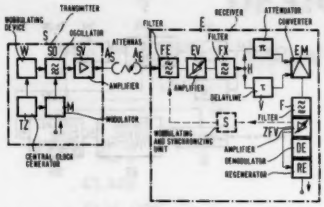
RADIO FREQUENCY TRANSMISSION SYSTEM

Klaus Vogel, Gelting, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 31, 1979, Ser. No. 108,460
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1979, 2901670
Int. Cl.³ H04L *7/06*
U.S. Cl. 375—1 **16 Claims**

1. A communications system for electromagnetic waves, consisting of a transmitter, in which the signal to be transmitted is modulated onto a carrier, a transmitting- and a receiving-antenna with a radio linkhop, dispensed therebetween and a receiver in which the received signal is converted into an IF-signal and demodulated, characterized by the following features: the transmitting signal is modulated in the transmitter with an intelligence signal and is controlled in its frequency-time-progression periodically between an upper and a lower frequency boundary by means for signal controlling and processing with at least one carrier oscillator, in such a manner that the absolute value of the frequency difference of the transmitting signal, relative to the times t and $t+\tau$, is constant for all times t within the sweep time T, and there results at the receiv-

ing converter of the receiver, a constant intermediate frequency containing the modulation, by virtue of the fact that the amplified receiving signal is separated by two branches, with one branch connected with the one input of the receiving converter, and the other is connected through a delay line,



with the other input of the receiving converter, the intermediate frequency of the receiving converter is subsequently supplied to a filter, an amplifier and a demodulator and subsequently the method-conditioned transit time distortion of the intelligence signal is corrected.

4,312,073

SPECTRUM CONVERTER FOR ANALOG SIGNALS

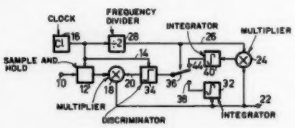
Edmond de Niet, and Albert M. A. Rijckaert, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 28, 1980, Ser. No. 144,792

Claims priority, application Netherlands, May 3, 1979, 7903466

Int. Cl.³ H04L *3/00*

U.S. Cl. 375—19 **3 Claims**



1. A device for receiving a first stream of multivalent signals having a single arithmetic sign at a first repetition frequency, and for converting these signals into a bipolar second stream of at least quasi-analog output signals, said device comprising:

an input for said stream; a synchronization device for generating said first frequency for therewith enabling successive elements of said first stream;

a processing circuit for receiving said successive elements for subjecting these to a multiplication operation and having a first output;

a first integrator having its input connected to said first output and having a second output;

a forward-reverse integrator having its input connected to said first output and having a third output;

a divider for receiving said first frequency and deriving therefrom a bivalent control signal at a fourth output which is connected to a control input of said forward-reverse integrator for in synchronism with the reception of successive elements of said first stream alternating the direction of integration namely, at a first value as a forward integrator while at a second value as reverse integrators;

an alternating connector having a second control input connected to said fourth output for under control of said first value through-connecting said third output and under control of said second value through-connecting said second output, said connector furthermore having a fifth output;

a discriminator circuit having an input connected to said fifth output and having a sixth output for outputting a bivalent control signal;

wherein said processing circuit has a third control input connected to said sixth output whereby, the sign of the multiplicand is the same as the sign of the output signal of the discriminator circuit; and

wherein the frequency spectrum of said second stream as derived from said processing circuit has a frequency spectrum with zero points both at zero frequency and at half said first frequency.

4,312,074

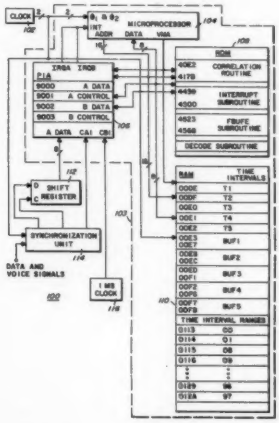
METHOD AND APPARATUS FOR DETECTING A DATA SIGNAL INCLUDING REPEATED DATA WORDS

James A. Pautler, St. Louis, Mo., and Kenneth A. Felix, Crystal Lake, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 7, 1980, Ser. No. 119,605

Int. Cl.³ H03D *1/00*

U.S. Cl. 375—96 **18 Claims**



18. A method for receiving a data signal, including at least three data words each preceded by a synchronization word, transmitted on a communication channel to a remote station, wherein said remote station includes memory means, means for receiving the data signal, means for detecting the synchronization word before each data word thereof, and means for providing a synchronization indication signal upon detection of each synchronization word, said method comprising the steps of:

(a) storing a received data word in the memory means in response to the synchronization indication signal;

(b) measuring the time interval between a previously received data word and the presently received data word, and storing said measured time interval in the memory means with the presently received data word;

(c) incrementing each previously stored time interval by said measured time interval and storing said incremented time interval in the memory means in place of said previously stored time interval; and

(d) correlating the stored time intervals with predetermined time interval ranges and providing a correlation indication signal if at least three stored time intervals occur within said predetermined time interval ranges.

4,312,075

TIMING-PHASE RECOVERY CIRCUIT

Kazuo Murano, Tokyo; Shigeyuki Unagami; Yoshikazu Itoh, both of Kawasaki; Fumio Amano, Yokohama, and Tatsuki Hayashi, Kawasaki, all of Japan, assignors to Fujitsu Limited, Japan

Filed Jul. 11, 1979, Ser. No. 56,641

Claims priority, application Japan, Jul. 14, 1978, 53-85842; Jul. 29, 1978, 53-92778; Jul. 31, 1978, 53-93503; Sep. 28, 1978, 53-119677

Int. Cl.[3] H04L 7/02

U.S. Cl. 375—106 19 Claims

1. A timing-phase recovery circuit used for achieving a tuning operation between a phase of a sampling signal generated in a receiver and a phase of a timing signal included in a received input analogue signal, comprising:

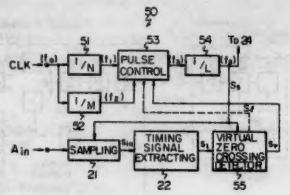
(a) a reference clock generating means for generating a reference clock signal;

(b) a sampling signal generating means for generating the sampling signal which is derived from the reference clock signal;

(c) a sampling means for producing a sampled input analogue signal by using the sampling signal;

(d) a timing signal extracting means for producing the timing signal from the sampled input analogue signal; and

(e) a virtual zero crossing detecting means for comparing the value of the timing signal with a zero value and for generating a virtual zero crossing detecting signal by using the sampling signal, said sampling signal generating means conducting a phase shift of the sampling signal in accordance with the existence or non-existence of the virtual zero crossing detecting signal.



DESIGN PATENTS

GRANTED JAN. 19, 1982

ERRATA

For CLASS	See PATENT NO.
D34–029	262,695
D32–021	262,708

262,665

SLIDE FASTENER PULL TAB

Robert E. Brinley, Southington, Conn., assignor to Scovill Inc., Waterbury, Conn.

Filed Oct. 29, 1979, Ser. No. 89,048

Term of patent 14 years

Int. Cl. D02—*07*

U.S. Cl. D2—415

262,666

HAND KNITTER'S SUPPORT STAND FOR YARN PACKAGES

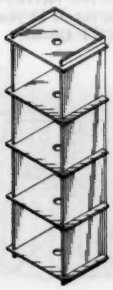
Milton E. Tager, Gastonia, N.C., assignor to Delaine Worsted Mills, Inc., Gastonia, N.C.

Filed Apr. 30, 1979, Ser. No. 34,462

Term of patent 14 years

Int. Cl. D02—*99*

U.S. Cl. D3—23



262,667

SHOE TIE STAND

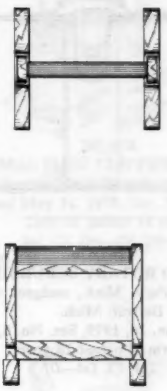
David D. Thompson, Box 122, 410 N. Race St., Princeton, Ind. 47670

Filed Mar. 10, 1980, Ser. No. 129,019

Term of patent 14 years

Int. Cl. D3—*99*

U.S. Cl. D3—30.5



262,668

HANDLE FOR A BAG

Jacques Robitaille, Montreal, Canada, assignor to Atwater Bag Corporation, Montreal, Canada

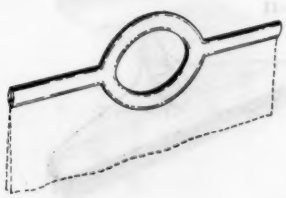
Filed Feb. 4, 1980, Ser. No. 118,629

Claims priority, application Canada, Nov. 30, 1979, 30-11-79-2

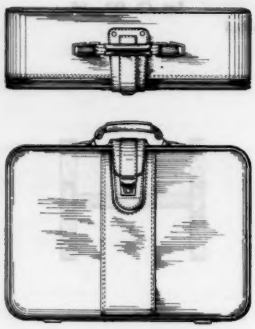
Term of patent 14 years

Int. Cl. D3—*99*

U.S. Cl. D3—54

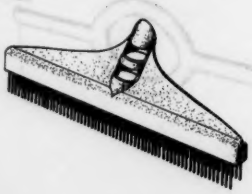


262,669
LUGGAGE CASE
Michael Davis, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Filed Jan. 21, 1980, Ser. No. 114,113
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

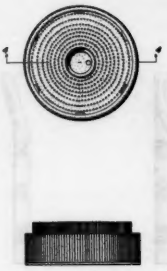


262,670
AIR POWERED ROTARY SCRUBBING BRUSH
Martin Wellin, Oak Park, Mich., assignor to U.S. Industrial Tool & Supply Co., Detroit, Mich.
Filed Jan. 25, 1979, Ser. No. 6,321
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—02

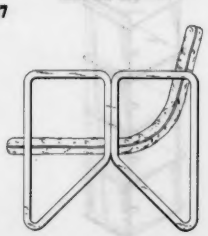
262,671
CARPET GROOMING TOOL
Bernard A. Erickson, Rockford, Ill., assignor to Groom Industries, Inc., Rockford, Ill.
Filed Nov. 1, 1979, Ser. No. 90,143
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—11



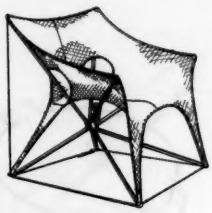
262,672
FACIAL BRUSH
David O. Chase, Skaneateles, N.Y., and Clemens A. Iten, Staunton, Va., assignors to American Safety Razor Company, Verona, Va.
Filed May 9, 1979, Ser. No. 37,576
Term of patent 14 years
Int. Cl. D4—*02*; D28—*03*
U.S. Cl. D4—19



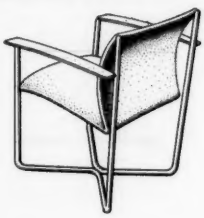
262,673
CHAIR
Steven D. Gageby, 12 Hay Camp Rd., North Oaks, Minn. 55110
Division of Ser. No. 911,470, Jun. 1, 1970, which is a division of Ser. No. 677,747, Apr. 16, 1976. This application Jun. 1, 1979, Ser. No. 44,411
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67



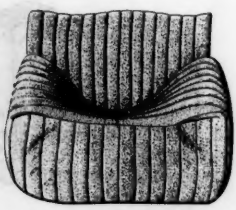
262,674
FOLDING CHAIR
William F. Logan, 3rd, #70 Laight St. - 5th Floor, New York, N.Y. 10013
Filed Jan. 26, 1979, Ser. No. 6,781
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69



262,675
ARMCHAIR
David L. Rowland, 8 E. 62nd St., New York, N.Y. 10021
Filed Jun. 11, 1979, Ser. No. 47,482
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69



262,676
CHAIR
Pierre E. C. Roset, Montagnieu, France, assignor to Cinna, Societe Anonyme, Briord, France
Filed Mar. 9, 1979, Ser. No. 19,781
Claims priority, application France, Oct. 4, 1978, 133
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—71

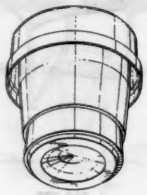


262,677
CHAIR
David L. Rowland, 8 E. 62nd St., New York, N.Y. 10021
Filed Jun. 11, 1979, Ser. No. 47,481
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—75

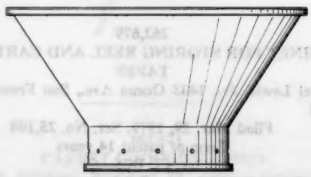
262,678
ANIMAL HAIR CLIPPER HOLDER
Hedde DeBoer, Gowanstown, Ontario, Canada (N0G 1Y0)
Filed May 14, 1979, Ser. No. 38,583
Term of patent 14 years
Int. Cl. D6—*04*; D8—*08*
U.S. Cl. D6—130

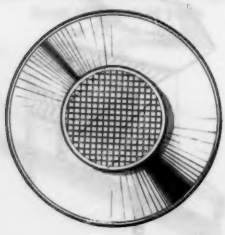
262,679
CABINET FOR STORING REEL AND CARTRIDGE TAPES
Nathaniel Lewis, Jr., 1433 Ocean Ave., San Francisco, Calif. 94112
Filed Mar. 29, 1979, Ser. No. 25,108
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—169

262,680
CUP
Bryan E. C. Lack, Banbury, and Robert E. Coles, Leamington Spa, both of England, assignors to General Foods Ltd., Oxfordshire, England
Filed Apr. 2, 1979, Ser. No. 26,072
Claims priority, application United Kingdom, Oct. 6, 1978, 986742
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—6

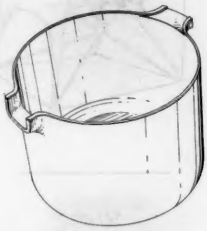


262,681
COMBINED BOWL AND SIEVE FOR POPPED POPCORN
David L. Dawson, 1915 Kimberly Dr., Klamath Falls, Oreg. 97601
Filed Jun. 7, 1979, Ser. No. 46,479
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—47

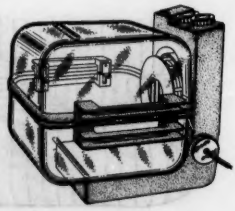




262,682
FOOD MIXING BOWL
Andre Morin, Montreal, Canada, assignor to Les Industries Provinciales Ltee., St. Damien, Canada
Filed Jul. 9, 1979, Ser. No. 55,598
Claims priority, application Canada, Jun. 21, 1979, 2106798
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—64



262,683
HOT AIR GRILL
Jurgen Assmann, Michelbach, Fed. Rep. of Germany, assignor to Grossag GmbH, Fed. Rep. of Germany
Filed Jun. 6, 1978, Ser. No. 913,123
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1977, 3488[U]
Term of patent 14 years
Int. Cl. DO7—*02*
U.S. Cl. D7—85

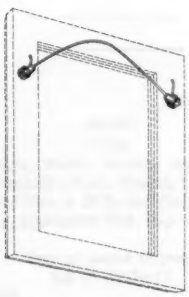


262,684
ONION SCOOP OR THE LIKE
Robert H. C. M. Daenen, Hekelgem, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Apr. 28, 1980, Ser. No. 144,468
Term of patent 14 years
Int. Cl. DO7—*06*
U.S. Cl. D7—148

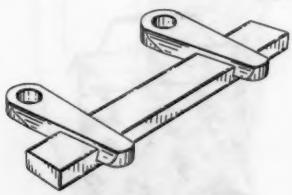
262,685
DECORATIVE FACIA PLATE AND LEG COVERS FOR A FIRE GRATE
Robert Hamilton, 5 The Rise, Elstree, Hertfordshire, England
Filed Nov. 15, 1978, Ser. No. 962,027
Claims priority, application United Kingdom, May 17, 1978, 984629
Term of patent 14 years
Int. Cl. D7—*08;* D23—*03*
U.S. Cl. D7—207

262,686
SHOVEL
Lloyd T. Anderson, 35 Spook Hill Rd., Wappinger's Falls, N.Y. 12590
Filed Apr. 20, 1979, Ser. No. 31,823
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—210

262,687
ADJUSTABLE READILY DETACHABLE PICTURE HANGING DEVICE
Theodore D. A. Collet, 6140 Calle Tuberia, Scottsdale, Ariz. 85251
Filed Nov. 29, 1977, Ser. No. 855,750
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—373



262,688
HOLDER FOR BAGS FOR WASTE PRODUCTS
Erik W. Nilsson, Tessins väg 8 A, S-217 58 Malmö, Sweden
Filed Jul. 2, 1979, Ser. No. 54,136
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—373



262,689

HOSE RETAINING DEVICE

Donald R. Beck, P.O. Box 906, Joseph, Oreg. 97846

Filed Jul. 11, 1979, Ser. No. 56,700
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—396

262,690

THEATRICAL SAND BAG

Garrett R. Berry; Patricia A. Berry, both of 116 Parkside Dr., Suffern, N.Y. 10901; Elmer H. Berry, Jr., and Katherine S. Berry, both of 126 Ardwick Ter., Lansdale, Pa. 19446

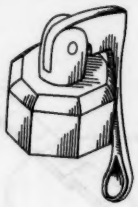
Filed Oct. 5, 1979, Ser. No. 82,079
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—499

262,691

COMBINED VIAL CAP AND DISPENSING SPOON

Ronald L. Horsley, 1805 E. 14th St., San Leandro, Calif. 94577

Filed Jun. 12, 1978, Ser. No. 914,913
Term of patent 14 years
Int. Cl. D09—*99*
U.S. Cl. D9—338



262,692

WRIST WATCH

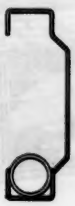
Ronald Kurowsky, Birkenfeld/Pforzheim, Fed. Rep. of Germany, assignor to Chopard & Cie S.A., Geneva, Switzerland

Filed Feb. 8, 1980, Ser. No. 119,811
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

262,693
DENSITY MEASURING BALANCE
David E. Cain, Houston, Tex., assignor to Halliburton Services, Duncan, Okla.
Filed Mar. 17, 1980, Ser. No. 130,965
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—90

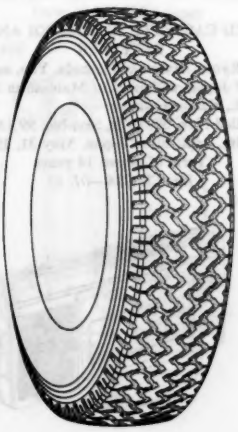
262,694
DIGITAL SCALE
Joe Solomon, 3586 Barham Blvd., Los Angeles, Calif. 90068
Filed Jul. 31, 1979, Ser. No. 62,572
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—93

262,695
RAIL FOR SUSPENDED MONORAIL CONVEYERS
Gaetano Di Rosa, Turin, Italy, assignor to F.A.T.A. European Group S.p.A., Pianezza, Italy
Filed Sep. 28, 1978, Ser. No. 946,921
Claims priority, application Italy, Apr. 7, 1978, 53155 B/78
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D34—29

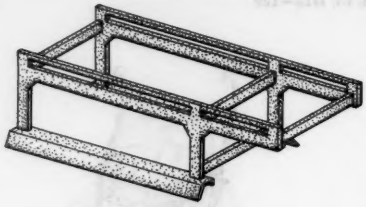


262,696
BABY CARRIAGE
Giuseppe Perego, Arcore, Italy, assignor to Perego-Pines S.p.A., Italy
Filed Apr. 12, 1979, Ser. No. 29,483
Claims priority, application Italy, Oct. 12, 1978, 23035/78[U]
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—129

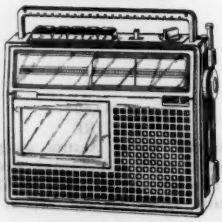
262,697
TIRE
Geraldine Rollinger, Baden, Austria, assignor to Deutschen Semperit Gesellschaft m.b.H., Munich, Fed. Rep. of Germany
Filed Nov. 8, 1979, Ser. No. 92,341
Claims priority, application Fed. Rep. of Germany, May 8, 1979, 11,694
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146



262,698
CARRIER RACK FOR PICKUP TRUCKS
Edward L. Hagist, Rte. 1, Box 58, Keota, Iowa 52248
Filed Aug. 3, 1979, Ser. No. 63,246
Term of patent years
Int. Cl. D12—*16*
U.S. Cl. D12—156

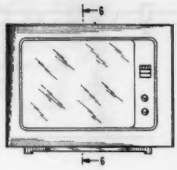


262,699
COMBINED CASSETTE RECORDER PLAYER AND RADIO
John T. Houlihan, South Bend, Ind., assignor to General Electric Company, New York, N.Y.
Filed Sep. 25, 1978, Ser. No. 945,188
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—5

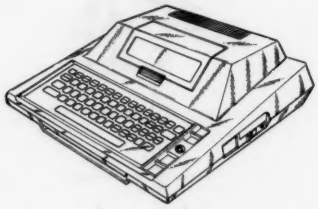


262,700
COMBINED CASSETTE RECORDER AND RADIO RECEIVER
Takao Okada, Kyoto; Masanori Hamada, Yao, and Kikuo Ohta, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Nov. 30, 1979, Ser. No. 99,130
Claims priority, application Japan, May 31, 1979, 54-22464
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—5

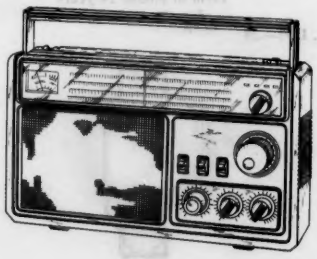
262,701
COMPUTER DISPLAY
Manabe Yoshiyuki, Yamato, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed May 18, 1979, Ser. No. 40,261
Claims priority, application Japan, Nov. 24, 1978, 53-49557
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—113



262,702
KEYBOARD CONSOLE
Jeffery O. Nelson, Redwood City, and Douglas A. Hardy, Portola Valley, both of Calif., assignors to Atari, Inc., Sunnyvale, Calif.
Filed May 4, 1979, Ser. No. 36,102
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—100

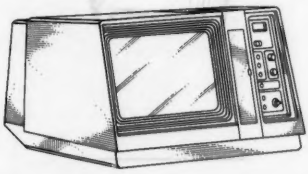


262,703
PORTABLE RADIO
Leonard J. Mysliwiec, Fort Wayne, Ind., assignor to The Magnavox Company, New York, N.Y.
Filed Apr. 24, 1979, Ser. No. 32,824
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70



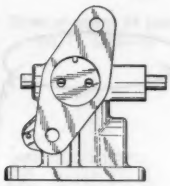
262,704
PROJECTION TELEVISION CONSOLE
Daniel R. Pierog, Willow Spring, Ill., assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Aug. 13, 1979, Ser. No. 65,989
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—79

262,705
CATHODE RAY TUBE COMPUTER DISPLAY
John W. Goodin, Long Beach; Douglas H. Grambush; Milton J. Halsted, both of Irvine, all of Calif., and Katsuo Kumagai, Kanazawa, Japan, assignors to Fujitsu Limited, Kanagawa, Japan
Filed Jun. 18, 1979, Ser. No. 49,240
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—106

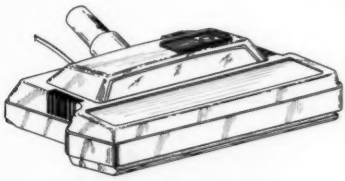


262,706
COMBINED TERMINAL AND SELF-CONTAINED COMPUTER SYSTEM
Albert E. Vierling; Harry C. Nicholson, and Earl J. Huddleston, all of Cincinnati, Ohio, assignors to ReyZon Computers, Cincinnati, Ohio
Filed Aug. 8, 1979, Ser. No. 64,836
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—106

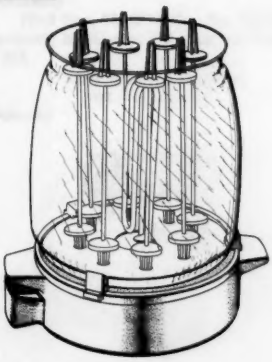
262,707
GAS CARBURETOR
Billy D. Thompson, Box 313, Wheatland, Okla. 73097
Filed Oct. 12, 1979, Ser. No. 84,092
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D15—6



262,708
SUCTION NOZZLE OR THE LIKE
John D. Essex, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Feb. 6, 1980, Ser. No. 119,184
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—21



262,709
VERTICAL ROTISSERIE
Robert A. Williams; Marshall B. Johnson; Robert S. Myerly, and Leo F. Brown, all of Chillicothe, Ohio, assignors to Wear-Ever Aluminum, Inc., Chillicothe, Ohio
Filed Mar. 18, 1980, Ser. No. 131,466
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—106

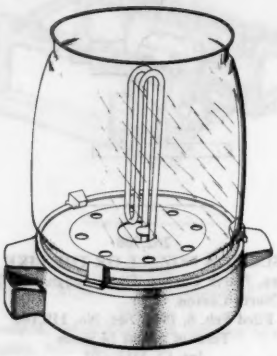


262,710

BASE AND COVER FOR A VERTICAL ROTISSERIE

Robert A. Williams; Marshall B. Johnson, and Robert S. Myerly, all of Chillicothe, Ohio, assignors to Wear-Ever Aluminum, Inc., Chillicothe, Ohio

Filed Mar. 18, 1980, Ser. No. 131,484
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—106

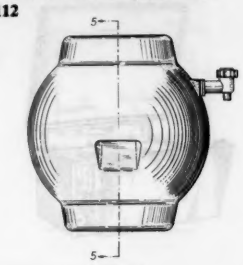


262,711

BEVERAGE DISPENSER

Paul R. Cox, Northamptonshire, and Basil J. Coffey, York, both of England, assignors to Orme Polymer Engineering Limited, Wellingborough, England

Filed Jul. 20, 1979, Ser. No. 59,172
Claims priority, application United Kingdom, Feb. 9, 1979, 988486/79
Term of patent 14 years
Int. Cl. D07—*07*; D15—*08*
U.S. Cl. D15—112

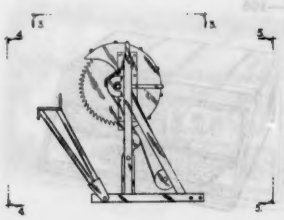


262,712

VEHICLE TRANSPORTABLE CORDWOOD CUTTING MACHINE

Frank J. Serwatowski, 12155 Spencer, Milford, Mich. 48042

Filed Apr. 30, 1979, Ser. No. 34,640
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—133



262,713

CAMERA

Takaharu Kato, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

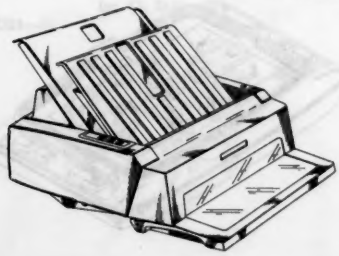
Filed Sep. 27, 1978, Ser. No. 946,186
Claims priority, application Japan, Mar. 27, 1978, 53-11647
Term of patent 3½ years
Int. Cl. D16—*01*
U.S. Cl. D16—08

262,714

AUTOMATIC PAPER FEEDER OR SIMILAR ARTICLE

Wayne C. Cathey, Bedford; Barry C. Kockler, Lewisville, and Albert R. Clark, Dallas, all of Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed May 29, 1979, Ser. No. 43,181
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—30

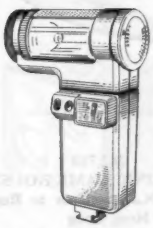


262,715

ELECTRONIC FLASH UNIT

Norbert Schlagheck; Herbert Schultes, both of Fuerstenfeldbruck, and Hermann R. Segers, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Nov. 19, 1979, Ser. No. 95,537
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1979, MR 568
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—42

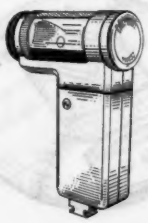


262,716

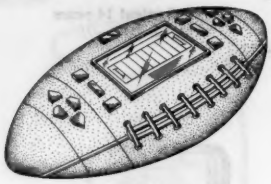
ELECTRONIC FLASH UNIT

Norbert Schlagheck; Herbert Schultes, both of Fuerstenfeldbruck, and Hermann R. Segers, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

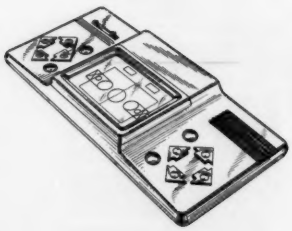
Filed Nov. 19, 1979, Ser. No. 95,538
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1979, MR 568
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—42



262,717
ELECTRONIC FOOTBALL GAME HOUSING
Morris Dweck, Deal, N.J., assignor to Regency Electronics (HK) Ltd., Kowloon, Hong Kong
Filed Feb. 25, 1980, Ser. No. 124,511
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13



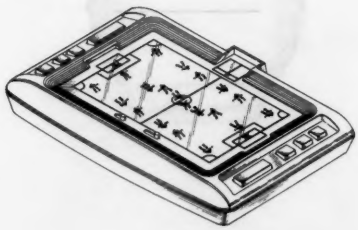
262,718
ELECTRONIC GAME HOUSING
Morris Dweck, Deal, N.J., assignor to Regency Electronics (HK) Ltd., Kowloom, Hong Kong
Filed Feb. 25, 1980, Ser. No. 124,582
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13



262,719
ELECTRONIC BASEBALL GAME HOUSING
Morris Dweck, Deal, N.J., assignor to Regency Electronics (HK) Ltd., Kowloon, Hong Kong
Filed Mar. 3, 1980, Ser. No. 126,187
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13

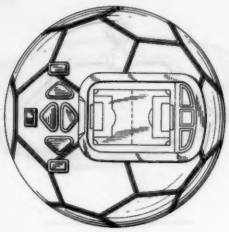
262,720
ELECTRONIC BASKETBALL GAME HOUSING
Morris Dweck, Deal, N.J., assignor to Regency Electronics (HK) Ltd., Kowloon, Hong Kong
Filed Mar. 3, 1980, Ser. No. 126,909
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13

262,721
ELECTRONIC SOCCER GAME HOUSING
Akio Tsuyuki, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Apr. 9, 1980, Ser. No. 138,717
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13

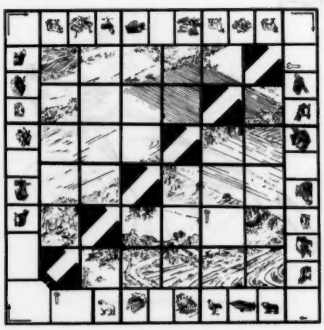


262,722
ELECTRONIC BASKETBALL GAME HOUSING
Akio Tsuyuki, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Apr. 9, 1980, Ser. No. 138,718
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13

262,723
ELECTRONIC SOCCER GAME HOUSING
Morris Dweck, Deal, N.J., assignor to Regency Electronics (HK) Ltd., Kowloon, Hong Kong
Filed Apr. 14, 1980, Ser. No. 139,791
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13

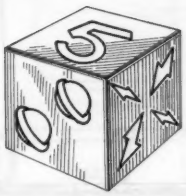


262,724
GAME BOARD
Dwight R. Santee, R.D. #1, Beloit, Ohio 44609
Filed Jul. 31, 1978, Ser. No. 929,252
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—25

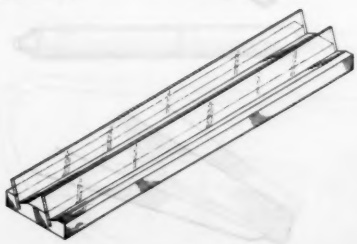


262,725
GAME DIE
James A. Rice, Brookline, Mass., assignor to Cosmic Wimpout Inc., Allston, Mass.
Filed Sep. 24, 1979, Ser. No. 78,479
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—41

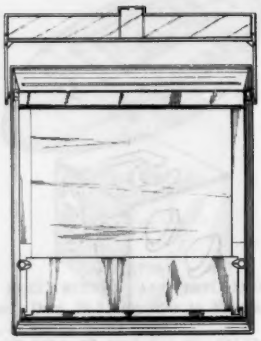
262,726
GAME DICE
James A. Rice, Brookline, Mass., assignor to Cosmic Wimpout Inc., Allston, Mass.
Filed Sep. 24, 1979, Ser. No. 78,480
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—41



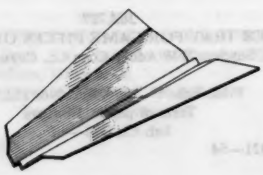
262,727
HOLDER TRAY FOR GAME PIECES OR THE LIKE
William J. Snyder, 7249 Adobe Casa Ct., Citrus Heights, Calif. 95610
Filed Feb. 19, 1980, Ser. No. 122,711
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—54

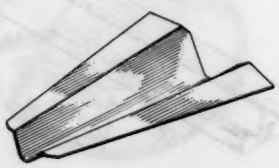


262,728
TOY DESK
Frederick H. Kroll, 72 Wood Hollow La., New Rochelle, N.Y. 10804
Filed Aug. 22, 1979, Ser. No. 68,607
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—59



262,729
TOY AIRPLANE
Bernard R. Barrett, 305 Graham St., Lombard, Ill. 60148
Filed Aug. 2, 1979, Ser. No. 63,349
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—89

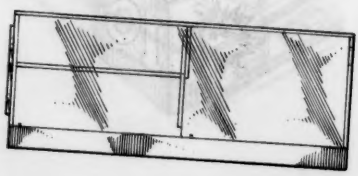




262,730
EXERCISE BAR FOR PHYSICAL EXERCISER
Lloyd J. Lambert, Jr., and Lloyd J. Lambert, Sr., both of 1538 College Ave., South Houston, Tex. 77587
Filed Dec. 4, 1979, Ser. No. 100,152
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—198

262,731
HUNTER'S KNIFE
Marvin L. Austin, Rte. 1, Box 117, Mount Pleasant, N.C. 28124
Filed Jan. 11, 1980, Ser. No. 111,225
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—1

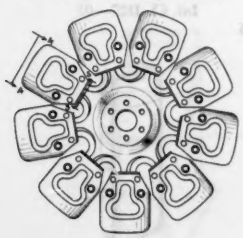
262,732
RODENT TRAP
John E. Warren, and Richard Warren, both of P.O. Box 5303, Port Isabel, Tex. 78578
Filed Jun. 4, 1979, Ser. No. 45,189
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—18



262,733
COMBINED TOILET SEAT AND COVER, OR SIMILAR ARTICLE
Acton Bjørn, Copenhagen, Denmark, assignor to Dansk Pressalit A/S, Arhus, Denmark
Filed Jun. 9, 1980, Ser. No. 157,754
Claims priority, application Denmark, Jan. 8, 1980, 21/80
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71

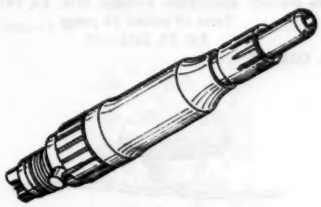
262,734
FAN SPIDER
John A. Wooden, Oaklandon, Ind., assignor to Brookside Corporation, McCordsville, Ind.
Filed Sep. 17, 1979, Ser. No. 76,131
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—165

262,735
FAN
John A. Wooden, Oaklandon, Ind., assignor to Brookside Corporation, McCordsville, Ind.
Filed Sep. 17, 1979, Ser. No. 76,132
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—165

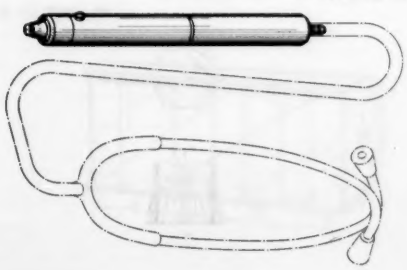


262,736
FAN BLADE
John A. Wooden, Oaklandon, Ind., assignor to Brookside Corporation, McCordsville, Ind.
Filed Sep. 17, 1979, Ser. No. 76,133
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—165

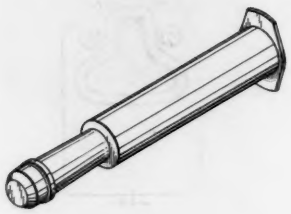
262,737
DENTAL AIR MOTOR
Moshe Meller, Nahariya, Israel, assignor to Adimec, Advanced Mechanical Ltd., Nahariya, Israel
Filed Jan. 31, 1980, Ser. No. 117,077
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—12



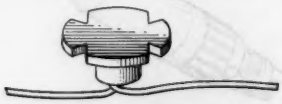
262,738
BLOOD FLOW DETECTOR
Masuo Sugawara, Tokorazawa, and Hiroji Matsumoto, Kawasaki, both of Japan, assignors to Hayashi Denki Company Ltd., Kanagawa, Japan
Filed Mar. 5, 1979, Ser. No. 17,341
Term of patent 14 years
Int. Cl. 24—*02*
U.S. Cl. D24—17



262,739
COMBINED SYRINGE BARREL, NEEDLE HOOD AND CAP THEREFOR
Norman L. Nitshke, Central Square, N.Y., assignor to Bristol-Myers Company, New York, N.Y.
Filed Aug. 28, 1978, Ser. No. 937,674
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—25

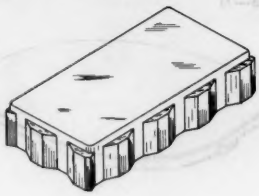


262,740
CUTTING WIRE FOR PLASTER-OF-PARIS BANDAGE
Karl I. Wahl, Ekerö, Sweden, assignor to Landstingens Inkopscentral, LIC, Solna, Sweden
Filed Mar. 26, 1979, Ser. No. 24,087
Claims priority, application Sweden, Mar. 13, 1979, 790643
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—28



262,741
MICROBIOLOGICAL CLOSURE
John E. Fay, Leominster, Mass., assignor to Biomedical Polymers, Inc., Sterling, Mass.
Filed Jun. 12, 1978, Ser. No. 914,345
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—99

262,742
PAVEMENT BLOCK
Jørgen K. Vesterholt, 41 Amaliegade, Copenhagen K, Denmark (1256)
Filed Jun. 29, 1979, Ser. No. 53,609
Claims priority, application Denmark, Dec. 29, 1978, 1046/78
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—92

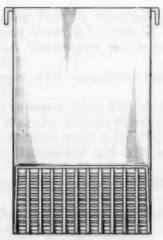


262,743
LAMP
Garry Jones, 1911 Heather Cir., Apt. 3, Yeadon, Pa. 19150
Filed Oct. 13, 1978, Ser. No. 951,220
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—80

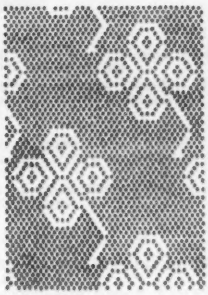
262,744
LIGHTER
Franz A. Stützer, Muhlheim, and Bernd Figur, Seligenstadt, both of Fed. Rep. of Germany, assignors to Rowenta-Werke, GmbH, Offenbach, Fed. Rep. of Germany
Filed Jan. 9, 1979, Ser. No. 2,130
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1978, 510113
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36

262,745
LIGHTER
Franz A. Stützer, Muhlheim, and Bernd Figur, Seligenstadt, both of Fed. Rep. of Germany, assignors to Rowenta-Werke, GmbH, Offenbach, Fed. Rep. of Germany
Filed Jan. 9, 1979, Ser. No. 2,131
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1978, 510113
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

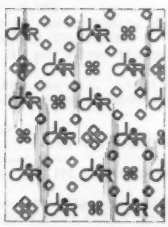
262,746
ANIMAL FEEDER
Dale C. Harris, Fairland, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Filed Oct. 29, 1979, Ser. No. 88,893
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—15



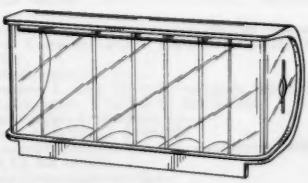
262,747
PAPER TOWELING OR SIMILAR ARTICLE
M. Dallas Erickson, Menasha, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Jan. 14, 1980, Ser. No. 111,767
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D59—2 B



262,748
FABRIC OR THE LIKE
Michel Tixier, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt, France
Filed Jul. 12, 1979, Ser. No. 57,009
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D92—1 W



262,749
COIN RECEPTACLE
Auvo Taivalvuo, Sairakkala, Finland, assignor to Oy Mk-Tuote AB, Helsinki, Finland
Filed Feb. 23, 1979, Ser. No. 14,722
Claims priority, application Finland, Oct. 25, 1978, 66078
Term of patent 14 years
Int. Cl. D99—*00*
U.S. Cl. D99—34



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF JANUARY, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See*—
Nieminen, Jorma J.; and Engstrom Folke, 4,311,670, Cl. 422-145.000.

Abbott Laboratories: *See*—
Workman, Erwin F., Jr.; and Clark, Deborah M., 4,311,482, Cl. 23-230.00B.

Abbou, Clement: *See*—
Rey, Pierre; Leandri, Jacqueline; and Abbou, Clement, 4,311,659, Cl. 264-221.000.

Abbruzzese, Luigi: *See*—
Gozzo, Franco; Abbruzzese, Luigi; and Siddi, Giorgio, 4,311,516, Cl. 71-111.000.

ABC Auto Alarms, Inc.: *See*—
Faust, James H., 4,311,891, Cl. 200-61.45R.

Abdou-Sabet, Sabet; and Fath, Michael A., to Monsanto Company. Thermoplastic elastomeric blends of olefin rubber and polyolefin resin. 4,311,628, Cl. 260-33.6AQ.

Abe, Minoru, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Wind turbine. 4,311,434, Cl. 416-142.000.

Abe, Sigeharu; Tamura, Hideo; and Murakami, Takayuki, to Fujitsu Limited. Method of manufacturing semiconductor device. 4,311,546, Cl. 156-643.000.

Abend, Phillip G., to Quad Chemical Corporation. Tertiary amine personal care composition. 4,311,692, Cl. 424-70.000.

Abendroth, Paul; and Emrich, Helmust, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Sheet feeding assembly including provision for coordinated action of pre-gripper and front stop. 4,311,093, Cl. 101-232.000.

Abic Ltd.: *See*—
Doron, Arye, 4,311,711, Cl. 424-346.000.

Abramson, Alan; and Weil, Edward D., to Stauffer Chemical Company. Arbuzov reactions employing an aliphatic solvent. 4,311,652, Cl. 260-969.000.

ACF Industries, Incorporated: *See*—
Carlson, Edwin S., 4,311,298, Cl. 251-144.000.

Acra Electric Corporation: *See*—
Hummel, Matt N., 4,311,900, Cl. 219-535.000.

Adachi, Masahiro: *See*—
Tsuda, Hiroshi; and Adachi, Masahiro, 4,311,365, Cl. 350-399.000.

Adam, Gunter: *See*—
Volkl, Franz; Adam, Gunter; and Klose, Volker, 4,311,308, Cl. 273-73.00G.

Adams, John B., Jr., to Du Pont de Nemours, E. I., and Company. Substituted butanoic acid esters. 4,311,696, Cl. 424-226.000.

Adlerteg, Bo, to Asea AB. Switchgear bus and connection structure. 4,311,353, Cl. 339-22.00R.

Aeppli, Kurt, to Zellweger, Ltd. Capacitive thread stopping motion. 4,311,958, Cl. 324-61.00R.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Demazeau, Gerard; Maestro, Patrick; Plante, Theophile; Pouchard, Michel; and Hagenmuller, Paul, 4,311,770, Cl. 428-694.000.
Rey, Pierre; Leandri, Jacqueline; and Abbou, Clement, 4,311,659, Cl. 264-221.000.
Sigwalt, Pierre; Guyot, Patrick; and Fontanille, Michel, 4,311,818, Cl. 326-173.000.

Agency of Industrial Science & Technology: *See*—
Abe, Minoru, 4,311,434, Cl. 416-142.000.
Ohtsubo, Junji, 4,311,383, Cl. 356-28.500.

Agfa-Gevaert, N.V.: *See*—
Lemahieu, Raymond G.; Moelants, Felix J.; and Ville, Frans J., 4,311,787, Cl. 430-522.000.

Ahamed, Syed V., to Bell Telephone Laboratories, Incorporated. Serial encoding-decoding for cyclic block codes. 4,312,069, Cl. 371-37.000.

Ahne, Hellmut; Kuhn, Eberhard; Rubner, Roland; and Schmidt, Erwin, to Siemens Aktiengesellschaft. Method for the preparation of highly heat-resistant relief structures and the use thereof. 4,311,785, Cl. 430-283.000.

Akebono Brake Industry Co., Ltd.: *See*—
Watanabe, Yushiyo; Kimura, Toshihiko; and Kurata, Masayuki, 4,311,219, Cl. 188-71.800.

Akerlund, Sven G.; and Hook, Jan-Erik, to Sunds Defibrator AB; and Eka AB. Method for use in the defibration or refining of lignocellulose-containing fibrous materials. 4,311,553, Cl. 162-23.000.

Akesaka, Toshio, to Kabushiki Kaisha Iseki Kaihatsu Koki. Shield-type tunneling machine with toggle controlled bit plates in cutter disc. 4,311,344, Cl. 299-33.000.

Akesaka, Toshio; and Hada, Takeshi, to Kabushiki Kaisha Iseki Kaihatsu Koki; and Kabushiki Kaisha Aoki Kensetsu. Pipe jacking apparatus. 4,311,411, Cl. 405-184.000.

Akimura, Yoshitaka: *See*—
Mifune, Hiroyuki; Takada, Shunji; Akimura, Yoshitaka; and Sakai, Nobuo, 4,311,781, Cl. 430-264.000.

Akino, Morio; Yanagida, Seiichi; and Yamashita, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Fixed reel type endless tape cassette. 4,311,286, Cl. 242-55.19A.

Akiyama, Yuji: *See*—
Okada, Masashi; Akiyama, Yuji; Kawada, Takaharu; and Kawahara, Atsushi, 4,311,904, Cl. 250-204.000.

Akutsu, Masao: *See*—
Saito, Tadao; Akutsu, Masao; Sugiura, Hiroaki; and Endo, Shuzo, 4,311,246, Cl. 215-100.00A.

Akzo NV: *See*—
Buter, Roelof, 4,311,622, Cl. 260-18.0EP.

Alain, Jossic: *See*—
Jean, Eltgen; and Alain, Jossic, 4,312,045, Cl. 364-900.000.

Albright & Wilson Ltd.: *See*—
Cole, Robert; and Stephenson, James E., 4,311,855, Cl. 564-12.000.

Aldridge, Dennis R., to Davy McKee (Oil & Chemicals) Limited. Distillation process and apparatus for a barge-mounted plant. 4,311,564, Cl. 203-99.000.

Alfa-Laval AB: *See*—
Hovstadius, Oscar G., 4,311,270, Cl. 233-46.000.

Alfa-Laval S.A.: *See*—
Brinkman, Gerrit E., 4,311,087, Cl. 99-456.000.

Alfonsi, Lawrence A.: *See*—
Erkfritz, Donald S.; and Alfonsi, Lawrence A., 4,311,418, Cl. 407-39.000.

Allied Chemical Corporation: *See*—
Walther, James F., 4,311,771, Cl. 429-51.000.

Allied Corporation: *See*—
Crescentini, Lamberto; Blackman, Webb B., Jr.; DeCaprio, Joseph D.; Fisher, William B.; Lilley, Roy J., Jr.; and Wagner, John W., 4,311,642, Cl. 260-239.30A.
Dege, Gerald J.; Segal, Leon; DeBona, Bruce T.; and Cooke, Robert S., 4,311,822, Cl. 528-176.000.
Demmin, Timothy R.; and Rogic, Milorad M., 4,311,850, Cl. 560-131.000.
Lees, Robert; and Jones, Marvin C., 4,311,114, Cl. 118-694.000.
Peckinpaugh, Frank L.; and Benton, Kenneth R., Sr., 4,311,285, Cl. 242-18.0PW.

Allis-Chalmers Corporation: *See*—
Shupert, Paul T., 4,311,204, Cl. 180-54.00R.

Almagro Trading Company: *See*—
de Almagro, Ignacia, 4,311,101, Cl. 108-152.000.

Amano, Fumio: *See*—
Murano, Kazuo; Unagami, Shigeyuki; Itoh, Yoshikazu; Amano, Fumio; and Hayashi, Tatsuki, 4,312,075, Cl. 375-106.000.

Amax Inc.: *See*—
Batra, Ravi; and Taubenblat, Pierre W., 4,311,522, Cl. 75-153.000.
Queneau, Paul B.; Beckstead, Leo W.; and Huggins, Dale K., 4,311,679, Cl. 423-55.000.
Stewart, Daniel R.; and Heinicke, Joachim H., 4,311,201, Cl. 175-44.000.

Amemiya, Masaru: *See*—
Hiraoka, Hideo; Amemiya, Masaru; and Hagiwara, Hirotoshi, 4,311,941, Cl. 313-336.000.

American Baler Company, The: *See*—
Tea, Frank C., 4,311,092, Cl. 100-214.000.

American Cyanamid Company: *See*—
Birnbaum, Jay E.; Van Humbeeck, Luc; and Dessy, Franz, 4,311,707, Cl. 424-305.000.
Krueger, James E.; and Carpentier, Eugene A., 4,311,694, Cl. 424-180.000.
Shepherd, Robert G., 4,311,846, Cl. 546-226.000.

American Fletcher National Bank and Trust Company, special administrator: *See*—
Clinton, Albert J., deceased; and American Fletcher National Bank and Trust Company, special administrator, 4,311,710, Cl. 424-330.000.

American Hoechst Corporation: *See*—
Martin, Lawrence L.; Ong, Helen H.; Anderson, Vernon B.; and Crichlow, Charles A., 4,311,703, Cl. 424-263.000.

American Hospital Supply Corporation: *See*—
Joung, John J., 4,310,928, Cl. 2-161.00R.
Mayhan, Kenneth G.; Janssen, Robert A.; and Bertrand, William J., 4,311,573, Cl. 204-159.150.

American Motors Corporation-Jeep: *See*—
Palma, Victor J., 4,310,943, Cl. 15-250.010.

American Printers & Lithographers, Inc.: *See*—
Stern, Larry, 4,310,978, Cl. 40-600.000.

American Radionic Co., Inc.: *See*—
Stockman, Robert M., 4,312,027, Cl. 361-329.000.
American Standard Inc.: *See*—
Benjamin, Fred W.; and Leah, Paul M., 4,311,211, Cl. 186-53.000.
Ameron, Inc.: *See*—
Gysegem, A. Peter, 4,311,629, Cl. 260-33.6SB.
AMF Incorporated: *See*—
Arthur, Ronald H., 4,311,885, Cl. 200-16.00C.
Rulseh, Roger D., 4,311,886, Cl. 200-38.00R.
Ampex Corporation: *See*—
Gilligan, Thomas J.; Smith, James E.; and Wong, Yun P., 4,312,048, Cl. 365-195.000.
Ryan, John O., 4,312,014, Cl. 358-41.000.
Amtel, Inc.: *See*—
Karl, Robert D.; Kentosh, James M.; and Vitale, John, 4,310,937, Cl. 9-8.00P.
Anaconda Company, The: *See*—
Bench, Stephen M.; Thibodeau, Paul H.; Campbell, Guy M.; and Stump, Theodore M., 4,312,064, Cl. 370-71.000.
Anderson, Gordon K.; and King, James D. Motorcycle fuel tank carrying rack. 4,311,261, Cl. 224-31.000.
Anderson, Vernon B.: *See*—
Martin, Lawrence L.; Ong, Helen H.; Anderson, Vernon B.; and Crichlow, Charles A., 4,311,703, Cl. 424-263.000.
Andersson, Clarence A.: *See*—
Bratton, Raymond J.; and Andersson, Clarence A., 4,311,433, Cl. 416-97.00A.
Ando, Shimon: *See*—
Iwamoto, Taro; Ando, Shimon; Kusumoto, Sho; Omae, Tsutomu; Suzuki, Toshitaka; Takidera, Masatake; Koyama, Takaichi; Hamada, Kunio; and Yoshida, Kazuhiro, 4,311,556, Cl. 376-249.000.
Andreev, Oleg M.; Zakurdaev, Anatoly V.; and Vyzhimov, Vladimir. Mercury contact. 4,311,769, Cl. 428-642.000.
Andrulitis, William B.: *See*—
Kurth, William T.; and Andrulitis, William B., 4,311,869, Cl. 136-246.000.
Angers, John W.; and Korik, Lazar, to Immunology Development Corporation, The. Methodology for the immunodiagnosis of multiple sclerosis and/or malignant diseases from blood sample analysis. 4,311,686, Cl. 424-1.000.
Ansari, Hifzur R.; Isaac, Benjamin O.; and Wagner, Horst R., to Bush Boake Allen Limited. Perfumery compositions. 4,311,617, Cl. 252-522.00R.
Aoki, Hatsuo: *See*—
Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Imanaka, Hiroshi; Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; and Hashimoto, Masashi, 4,311,640, Cl. 260-112.50R.
Aoki, Takao: *See*—
Kadowaki, Hidejiro; Kurosaki, Yasuhide; Aoki, Takao; and Iwami, Naoki, 4,311,778, Cl. 430-54.000.
Aoyama, Tadamasa, to Kabushiki Kaisha Senesu Shoko. Deceleration method of driving source in location control. 4,311,945, Cl. 318-561.000.
Applied Devices Corporation: *See*—
Pittman, Roland, 4,311,046, Cl. 73-178.00R.
Aratani, Matsuhiko: *See*—
Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Imanaka, Hiroshi; Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; and Hashimoto, Masashi, 4,311,640, Cl. 260-112.50R.
Aratowerk Walter von Taschitzki: *See*—
von Taschitzki, Rainer, 4,311,117, Cl. 119-75.000.
ARES, Inc.: *See*—
Gillum, Richard R., 4,311,081, Cl. 89-33.0SF.
Aristo Corporation: *See*—
Seeney, Charles E.; Kraemer, John F.; and Hoffman, Larry J., 4,311,619, Cl. 260-7.000.
Armstrong World Industries: *See*—
Hall, James A.; and Kent, Raymond C., 4,311,034, Cl. 72-318.000.
Arnold, Carroll H., to Wain-Roy, Inc. Connectors. 4,311,428, Cl. 414-723.000.
Arthur, Ronald H., to AMF Incorporated. Snap action slide switch. 4,311,885, Cl. 200-16.00C.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Miyake, Tetsuya; Takeda, Kunihiko; and Ikeda, Akihiko, 4,311,799, Cl. 521-31.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Haraguchi, Keisuke, 4,311,376, Cl. 354-153.000.
Asai, Kuniaki: *See*—
Imai, Shozaburo; Suzuki, Haruo; Asai, Kuniaki; and Ueno, Katsuji, 4,311,823, Cl. 528-181.000.
Asano, Kazuhiro: *See*—
Mandai, Masaaki; Torisawa, Akira; Ueda, Makoto; Asano, Kazuhiro; Shida, Masaharu; and Satoh, Katsuhiko, 4,312,059, Cl. 368-157.000.
Asea AB: *See*—
Adlerteg, Bo, 4,311,353, Cl. 339-22.00R.
Ashimori Industry Co., Ltd.: *See*—
Ohtsuga, Hisao; Morinaga, Akio; and Morita, Akira, 4,311,548, Cl. 156-287.000.
Aso, Koichi: *See*—
Uedaira, Satoru; Ito, Shigeyasu; Aso, Koichi; and Hayakawa, Masatoshi, 4,311,539, Cl. 148-121.000.
Atlantic Richfield Company: *See*—
Johnson, Marvin F. L.; and Jaecker, John A., 4,311,582, Cl. 208-139.000.
Styring, Ralph E., Jr., 4,311,495, Cl. 62-17.000.
Atlas Powder Company: *See*—
Oswald, Gerald L., 4,311,096, Cl. 102-202.130.
Auerbach, Horst; Nebe, Rainer; and Supp, Armin. Flotation apparatus. 4,311,240, Cl. 209-169.000.
Aulich, Hubert: *See*—
Hacker, Heinz; Aulich, Hubert; Grabmaier, Josef; and Douklias, Nikolaos, 4,311,726, Cl. 427-54.100.
Austin, John J., to Champion International Corporation. Easel display package. 4,311,233, Cl. 206-45.250.
Austin, Richard G.: *See*—
Pellegrini, John P., Jr.; Austin, Richard G.; and Beach, David L., 4,311,613, Cl. 252-429.00R.
Austin, Stephen B.: *See*—
Macrorie, Patrick L.; Rohrenbacher, Ronald C.; and Austin, Stephen B., 4,311,208, Cl. 182-18.000.
Automation Industries, Inc.: *See*—
Jeffras, Nathaniel B.; and Modispacher, Donald R., 4,311,052, Cl. 73-634.000.
Automobiles Peugeot: *See*—
Froumajou, Armand, 4,311,067, Cl. 74-718.000.
Autonomics, Inc.: *See*—
Gephardt, Roland, 4,310,994, Cl. 52-608.000.
Avery, Carl F., to Marion Health and Safety, Inc. Culture collecting and transporting unit. 4,311,792, Cl. 435-30.000.
B. F. Goodrich Company, The: *See*—
Chasar, Dwight W., 4,311,647, Cl. 260-453.0RW.
Marshall, Christine A.; and Scalera, Michael R., 4,311,044, Cl. 73-146.000.
Baba, Kousaku: *See*—
Endo, Hiroshi; Baba, Kousaku; and Matsumura, Akira, 4,311,876, Cl. 179-15.5ST.
Baba, Michiru, to Nippon Gakki Seizo Kabushiki Kaisha. Tuning apparatus. 4,312,044, Cl. 364-554.000.
Babcock-Hitachi Kabushiki Kaisha: *See*—
Matsuzaki, Harumi; Kuroda, Osamu; Okouchi, Isao; Izumi, Kenkichi; and Takahashi, Sankichi, 4,311,575, Cl. 204-180.00P.
Babiol, Pierre, to Societe Nouvelle de Bouchons Plastiques. Retractable pourer assemblies. 4,311,259, Cl. 222-525.000.
Bacardi Corporation: *See*—
Benjes, Henry H.; Wahbeh, Valery N.; and Stukenberg, John R., 4,311,593, Cl. 210-603.000.
Bach, Nicholas J.; and Kornfeld, Edmund C., to Eli Lilly and Company. Octahydro-2H-pyrrolo[3,4,-g]quinolines. 4,311,844, Cl. 546-84.000.
Bacher, Walter: *See*—
Jacob, Eberhard; and Bacher, Walter, 4,311,678, Cl. 423-19.000.
Backstein, Guenter; and Unger, Hans W., to Rheinmetall GmbH. Dual underwater safety fuse. 4,311,097, Cl. 102-229.000.
Bailen, Eddie H., to Omeco-St. John Co. Shock hazard protective apparatus for high voltage system. 4,312,022, Cl. 361-46.000.
Bailey, Alan G.: *See*—
Modes, Vernon E.; Tam, Hak W.; Quinton, Wayne E.; Bailey, Alan G.; Niskanen, Robert A.; Vitez, Lou; and DeBardi, Gary A., 4,311,152, Cl. 128-641.000.
Baker International Corporation: *See*—
Beall, Clifford H.; and Mullins, Albert A., II, 4,311,196, Cl. 166-134.000.
Mullins, Albert A., II, 4,311,195, Cl. 166-120.000.
Baker, John C.; Finley, Richard O.; Stanwood, David A.; and Bryson, Robert C., to Plastiflex Company International. Electromagnetic energy-carrying tube and fabrication method therefor, and the combination thereof with suction cleaning apparatus. 4,310,946, Cl. 15-363.000.
Baker Perkins Holdings Limited: *See*—
Wright, Edward J., 4,311,397, Cl. 366-98.000.
Baker, Philip L.: *See*—
Johnson, Curtis D.; and Baker, Philip L., 4,311,082, Cl. 89-191.00R.
Balaud, Daniel; Keledjian, Gaston; and Passemard, Jean R., to Regie Nationale des Usines Renault. Production-line automatic machine. 4,310,958, Cl. 29-26.00A.
Baldridge, Morris G., to Halliburton Company. Pile wiper seal. 4,311,414, Cl. 405-227.000.
Baldwin, Lawrence G.; Ehrlich, Burney J.; and Dixon, Jack B., to Tracor, Inc. Solvent mixing in HPLC using low pressure solvent metering pumps. 4,311,586, Cl. 210-101.000.
Balko, Edward N., to General Electric Co. Anode for reducing oxygen generation in the electrolysis of hydrogen chloride. 4,311,568, Cl. 204-128.000.
Ballato, Arthur; and Vig, John R., to United States of America, Army. Method of sweeping quartz. 4,311,938, Cl. 310-311.000.
Ballestia Chimica, S.p.A.: *See*—
Moretti, Giovanni, 4,311,650, Cl. 260-458.00R.
Balzer, Gerry C.; Gordon, Alan M.; Leibowitz, Michael W.; and Wittig, Karl R., to Bell Telephone Laboratories, Incorporated. Key telephone hold arrangement. 4,311,880, Cl. 179-99.00H.
Banba, Tosio; Morichika, Katsuyuki; and Nakanishi, Tetsuya, to Yanmar Diesel Engine Co., Ltd. Direct injection type diesel engine. 4,311,122, Cl. 123-279.000.

Bantz, David F.; Evangelisti, Carlo J.; and Nelson, Robert A., to International Business Machines Corporation. Diagnostic/debug machine architecture. 4,312,066, Cl. 371-16.000.
Barbeau, Dennis E., to Teledyne Industries, Inc. Turbine engine with shroud cooling means. 4,311,431, Cl. 415-172.00A.
Barham, Peter J.; Odell, Jeffrey A.; and Willmouth, Frank M., to Imperial Chemical Industries Limited. Heat-treating polyolefin films. 4,311,660, Cl. 264-342.0RE.
Barnes, John J.: *See*—
Chan, John Y.; and Barnes, John J., 4,311,930, Cl. 307-575.000.
Baron, Kenneth; and McArthur, Dennis P., to Union Oil Company of California. Process for reducing CO and SO_x emissions from catalytic cracking units. 4,311,581, Cl. 208-115.000.
Barr, Frank P., to Rockwell International Corporation. Transient signal processing circuit. 4,311,960, Cl. 324-103.00P.
Barrington, Claud C., to Exxon Production Research Company. Pressure insensitive valve. 4,311,297, Cl. 251-63.600.
Bartels, Harold U. Lip and radial seal. 4,311,317, Cl. 277-212.00C.
Barth, Hans-Helmut: *See*—
Dietz, Georg; and Barth, Hans-Helmut, 4,311,528, Cl. 106-35.000.
Bartholic, David B., to Engelhard Minerals & Chemicals Corporation. Preparation of FCC charge by selective vaporization. 4,311,579, Cl. 208-73.000.
Bartholic, David B., to Engelhard Minerals & Chemicals Corporation. Selective vaporization process and dynamic control thereof. 4,311,580, Cl. 208-91.000.
Bartke, Rolf. Apparatus for determining the reflectivity of the surface of a measured object. 4,311,393, Cl. 356-407.000.
Bartko, John; Tarneja, Krishan S.; Chu, Chang K.; and Schlegel, Earl S., to Westinghouse Electric Corp. Reducing the reverse recovery charge of thyristors by nuclear irradiation. 4,311,534, Cl. 148-1.500.
Barzano & Zanardo: *See*—
Falomo, Lodovico, 4,311,379, Cl. 354-313.000.
BASF Aktiengesellschaft: *See*—
Hahn, Klaus; Himmele, Walter; Naarmann, Herbert; and Penzien, Klaus, 4,311,636, Cl. 260-45.80N.
Lotsch, Wolfgang, 4,311,527, Cl. 106-22.000.
Basler, Gunter: *See*—
Ries, Karl; Hannoschock, Kurt; Rozic, Krsto-Marijan; Basler, Gunter; Sperl, Harald; and Weinschenk, Kurt, 4,311,905, Cl. 250-321.000.
Bassell, Marvin. Screw driver and screw head system. 4,311,071, Cl. 81-436.000.
Bateman, Charles D., to Sundstrand Data Control, Inc. Weight, balance, and tire pressure detection systems. 4,312,042, Cl. 364-463.000.
Batra, Ravi; and Taubenblat, Pierre W., to Amax Inc. Copper alloys with small amounts of manganese and selenium. 4,311,522, Cl. 75-153.000.
Battistin, Ferdinando. Linear mechanical variator. 4,311,061, Cl. 74-190.500.
Baumgartner Papier S.A.: *See*—
Bonnet, Jaques; and Lebet, Jean-Pierre, 4,311,156, Cl. 131-274.000.
Bayer Aktiengesellschaft: *See*—
Heine, Heinrich, 4,311,815, Cl. 525-504.000.
Reischl, Artur, 4,311,800, Cl. 521-109.000.
Baylor College of Medicine: *See*—
Melnick, Joseph L.; and Wallis, Craig, 4,311,794, Cl. 435-32.000.
BBC Brown, Boveri & Company, Limited: *See*—
Brunner, Hans-Peter; Caldor, Thomas; and Orgler, Helmut, 4,311,871, Cl. 174-74.00A.
Julke, Elias, 4,311,595, Cl. 210-671.000.
Kaelber, Gunter, 4,311,016, Cl. 60-687.000.
Schroder, Gunther, 4,311,890, Cl. 200-61.080.
Beach, Daryl R.; and Hayashi, Kazuo, to Kabushiki Kaisha Morita Seisakusho. Assembly for paired face to face dental trainees. 4,311,467, Cl. 434-264.000.
Beach, David L.: *See*—
Pellegrini, John P., Jr.; Austin, Richard G.; and Beach, David L., 4,311,613, Cl. 252-429.00R.
Pellegrini, John P., Jr.; Beach, David L.; and Kobylinski, Thaddeus P., 4,311,864, Cl. 585-530.000.
Beall, Clifford H.; and Mullins, Albert A., II, to Baker International Corporation. Tangentially loaded slip assembly. 4,311,196, Cl. 166-134.000.
Becker, Klaus; and Wolski, Karlheinz, to Mannesmann DeMag AG. Brake for a slide coaster sled. 4,311,215, Cl. 188-8.000.
Becker, Lanson, to General Signal Corporation. Pressure compensated steering system. 4,311,006, Cl. 60-385.000.
Beckman Instruments, Inc.: *See*—
Perry, Andrew W., 4,311,483, Cl. 23-230.00B.
Beckstead, Leo W.: *See*—
Queneau, Paul B.; Beckstead, Leo W.; and Huggins, Dale K., 4,311,679, Cl. 423-55.000.
Beffa, Fabio, to Ciba-Geigy Corporation. Chromium complexes of mixed azo compounds. 4,311,641, Cl. 260-145.00A.
Bege, Dietmar; and Puthawala, Anwer, to Kraftwerk Union AG. Method for cleaning mixing devices. 4,311,531, Cl. 134-10.000.
Begin, Pierre, to CEA of Canada, Ltd. High stability gas/electric pilot-ignitor. 4,311,452, Cl. 431-352.000.
Bell & Howell Company: *See*—
Maldarelli, Lawrence V., 4,312,006, Cl. 346-136.000.
Samek, Norbert E.; Garland, Thomas H.; and Connor, Robert J., 4,312,004, Cl. 346-1.100.
Bell, John C.: *See*—
Robinson, Darrell; and Bell, John C., 4,311,354, Cl. 339-36.000.
Bell Telephone Laboratories, Incorporated: *See*—
Ahamed, Syed V., 4,312,069, Cl. 371-37.000.
Balzer, Gerry C.; Gordon, Alan M.; Leibowitz, Michael W.; and Wittig, Karl R., 4,311,880, Cl. 179-99.00H.
Berkowitz, Paul R.; Quinn, Thomas M.; Trimble, David C.; and Wang, Tse L., 4,311,878, Cl. 179-16.0EC.
Chin, Gilbert Y.; Green, Martin L.; Sherwood, Richard C.; and Wernick, Jack H., 4,311,537, Cl. 148-108.000.
Wallace, Robert L., Jr., 4,311,874, Cl. 179-1.0CN.
Bellanger, Maurice G.; and Daguet, Jacques L., to Telecommunications Radioelectriques et Telephoniques. System for digitally converting baseband channel signals into a frequency-division multiplex signal and vice versa. 4,312,062, Cl. 370-50.000.
Bellettiere, Samuel J.; Hurley, Raymond; and Hoch, Samuel, to Tenneco Chemicals, Inc. Water-borne surface-coating compositions containing complexed cobalt driers. 4,311,625, Cl. 260-22.00R.
Bellos, Thomas J., to Petrolite Corporation. Corrosion inhibitor for highly oxygenated systems. 4,311,662, Cl. 422-12.000.
Belsky, Igal: *See*—
Gutnick, David L.; Rosenberg, Eugene; Belsky, Igal; and Zinaida, Zosim, 4,311,829, Cl. 536-18.000.
Gutnick, David L.; Rosenberg, Eugene; Belsky, Igal; and Zosim, Zinaida, 4,311,830, Cl. 536-53.000.
Gutnick, David L.; Rosenberg, Eugene; Belsky, Igal; and Zinaida, Zosim, 4,311,831, Cl. 536-53.000.
Gutnick, David L.; Rosenberg, Eugene; Belsky, Igal; and Zinaida, Zosim, 4,311,832, Cl. 536-53.000.
Bench, Stephen M.; Thibodeau, Paul H.; Campbell, Guy M.; and Stump, Theodore M., to Anaconda Company, The. Modified vestigial side band transmission system. 4,312,064, Cl. 370-71.000.
Bendix Corporation, The: *See*—
Gaiser, Robert F., 4,311,007, Cl. 60-562.000.
Nave, William E., 4,311,303, Cl. 267-160.000.
Runkle, Dean E., 4,311,085, Cl. 91-391.00R.
Spangler, Glenn E., 4,311,669, Cl. 422-98.000.
Titsworth, Jerry M., 4,311,962, Cl. 328-120.000.
Yee, Henry C., 4,311,986, Cl. 340-825.630.
Benjamin, Fred W.; and Leah, Paul M., to American Standard Inc. Service system. 4,311,211, Cl. 186-53.000.
Benjamin, Gary L., to Kuss Corporation. Water mattress with internal damping means. 4,310,936, Cl. 5-450.000.
Benjes, Henry H.; Wahbeh, Valery N.; and Stukenberg, John R., to Bacardi Corporation. Process for treatment of waste water. 4,311,593, Cl. 210-603.000.
Bennet, Joseph C.: *See*—
Funcik, Jack F.; Bennet, Joseph C.; Tubbs, Joseph T.; and Schneider, Thomas E., 4,310,967, Cl. 29-749.000.
Bennett, George, to Molins Limited. Apparatus for handling rod-like articles. 4,311,229, Cl. 198-457.000.
Benoit, Harry: *See*—
La Passo, Leonard J.; and Benoit, Harry, 4,311,049, Cl. 73-362.400.
Benoit, Michel; Gerlach, Pierre; Grolleau, Claude; and Lartillot, Alain, to Thomson CSF. Frequency band filter. 4,311,975, Cl. 333-207.000.
Benton, Kenneth R., Sr.: *See*—
Peckinpaugh, Frank L.; and Benton, Kenneth R., Sr., 4,311,285, Cl. 242-18.0PW.
Berdan, Betty L.; and Luce, Betty M., to Gould Inc. Printed circuit board having mutually etchable copper and nickel layers. 4,311,768, Cl. 428-626.000.
Bergero, Ramon. Balanced power transmission device. 4,311,435, Cl. 416-170.00R.
Berglund, Erik A.: *See*—
Hultman, Bengt G.; and Berglund, Erik A., 4,311,666, Cl. 422-62.000.
Bergstrom, Otto T., to Egberg Patents (Pty.) Limited. Classification of particulate material. 4,311,585, Cl. 209-211.000.
Berkowitz, Paul R.; Quinn, Thomas M.; Trimble, David C.; and Wang, Tse L., to Bell Telephone Laboratories, Incorporated. Dialing interval transmission gating arrangement. 4,311,878, Cl. 179-16.0EC.
Bernecker, Gunther, to Conlin, Donald B. Means for supplying a fuel/air mixture to an internal combustion engine. 4,311,128, Cl. 123-557.000.
Bernstein, Larry H. Automated kinetic determination of lactate dehydrogenase isoenzymes in serum. 4,311,791, Cl. 435-26.000.
Berry, Milton E., to Southwire Company. Melting furnace for granulated metal. 4,311,519, Cl. 75-72.000.
Bersier, Jacques; Jager, Horst; and Schwander, Hansrudolf, to Ciba-Geigy AG. Electrochemical process for the production of benzanthrone. 4,311,565, Cl. 204-73.00R.
Bert, Alain; Kaminsky, Didier; and Kantorowicz, Gerard, to Thomson CSF. Distributed amplifier for microwave frequencies. 4,311,966, Cl. 330-286.000.
Bert, Alain; and Le Clerc, Bernard, to Thomson-CSF. Microwave, solid-state, stabilized oscillator means. 4,311,970, Cl. 331-107.00R.
Bertrand, William J.: *See*—
Mayhan, Kenneth G.; Janssen, Robert A.; and Bertrand, William J., 4,311,573, Cl. 204-159.150.
Bessman, Samuel P. Reservoir for medicaments. 4,311,050, Cl. 73-427.000.
Beta, B.V.: *See*—
Engelander, Pieter, 4,311,892, Cl. 200-81.400.
Betz, Norman L.; Lanter, Kent J.; and Williams, Danny L., to Ralston Purina Company. Feed intake limiting acidulated fat for animals. 4,311,713, Cl. 426-2.000.

Bhattacharyya, Aniruddha, to Republic Steel Corporation; and Hanna Furnace Corporation, The. Method and apparatus for treatment of wastewater. 4,311,597, Cl. 210-731.000.

Bi-Modal Corporation: *See—*
Hindin, Eugene; Cripe, Alan R.; and Cripe, Christopher A., 4,311,244, Cl. 213-86.000.

Bianchi, John E. Gun sling with thumb support. 4,311,263, Cl. 224-150.000.

Bibaut, Gilbert. Dredging or excavating machine for marshes or canals. 4,310,975, Cl. 37-71.000.

Bibbee, Ernest B. Display board for educational exercises. 4,311,469, Cl. 434-404.000.

Bibbo, Peter P.; Hankins, Frederick E.; and Jakoplic, Richard, to Research Cottrell, Inc. Electrostatic precipitator control for high resistivity particulate. 4,311,491, Cl. 55-2.000.

Biggs, Ian; Goy, Ronald S.; and Whitehead, Kenneth E., to Dunlop Limited. Method of making reinforced tubular articles. 4,311,547, Cl. 156-244.130.

Biomedics, Inc.: *See—*
Brumfield, Robert C., 4,311,589, Cl. 210-177.000.

Birnbaum, Jay E.; Van Humbeeck, Luc; and Dessy, Franz, to American Cyanamid Company. Process for topically producing cutaneous vasodilation for the treatment of vasospastic or ischemic conditions. 4,311,707, Cl. 424-305.000.

Bison-Werke Bahre & Greten GmbH & Co. KG: *See—*
Kerttula, Into, 4,311,550, Cl. 156-555.000.

Blackman, Webb B., Jr.: *See—*
Crescentini, Lamberto; Blackman, Webb B., Jr.; DeCaprio, Joseph D.; Fisher, William B.; Lilley, Roy J., Jr.; and Wagner, John W., 4,311,642, Cl. 260-239.30A.

Blanchard, Clarence E., to Outboard Marine Corporation. Trolling motor. 4,311,470, Cl. 440-6.000.

Blanchard, Jeffrey R.; and Themmes, Lawrence J. Alarm device. 4,311,889, Cl. 200-52.00R.

Blandin, Denis, to Essilor International "Cie Generale d'Optique". Controlling release of molded material from mold during curing. 4,311,654, Cl. 264-2.300.

Blendax-Werke R. Schneider GmbH & Co.: *See—*
Hornig, Hans W., 4,311,604, Cl. 252-90.000.

Bloch, Ramon, to Safe Flight Instrument Corporation. Digital code error detection and alerting system. 4,312,071, Cl. 371-57.000.

Block, James P., to LCOA Laminating Company of America. Method for drilling circuit boards. 4,311,419, Cl. 408-1.00R.

Bloom, Arlene N., executrix: *See—*
Bloom, Stanley M., deceased; and Sachdev, Krishna G., 4,311,638, Cl. 260-330.000.

Bloom, Jeffrey A., to United States of America, America. Breakaway dual-legged sign support. 4,310,979, Cl. 40-607.000.

Bloom, Stanley; and Catanese, Carmen A., to RCA Corporation. CRT With dipolar deflection and quadrupolar-focusing color-selection structure. 4,311,944, Cl. 315-375.000.

Bloom, Stanley M., deceased (by Bloom, Arlene N., executrix); and Sachdev, Krishna G., to Polaroid Corporation. Silver complexing agents. 4,311,638, Cl. 260-330.000.

Blumle, Rudi. Method for the fabrication of an apparatus for the close fitting positioning of workpieces to be machined. 4,310,963, Cl. 29-460.000.

Bodor, Nicholas S.; Sloan, Kenneth B.; and Pogany, Stefano A., to INTERx Research Corporation. Novel dopa/dopamine prodrugs. 4,311,706, Cl. 424-301.000.

Boeing Company, The: *See—*
Carpenter, Dennis O.; and Ceola, Robert E., 4,311,466, Cl. 434-242.000.
Desjardins, Rene A.; and Sankewitsch, Vladimir, 4,311,213, Cl. 188-380.000.
Murphy, Richard J., 4,310,964, Cl. 29-469.000.

Bohm, Ludwig: *See—*
Diedrich, Bernd; Bohm, Ludwig; and Heine, Olaf, 4,311,752, Cl. 428-220.000.

Bohner, Beat; and Rempfler, Hermann, to Ciba-Geigy Corporation. Herbicidal α-phenoxypropionylazoles, compositions containing them, and method of use thereof. 4,311,513, Cl. 71-92.000.

Bolick, Fred C., Jr., to Lanier Business Products, Inc. Cassette apparatus and method for retaining selected segments of tape. 4,312,021, Cl. 360-132.000.

Bollinger, Frederic G., to Monsanto Company. Process for preparing substituted 2-imino-4-dihalomethylene 1,3-dithiolane compounds which are useful as herbicidal antidotes. 4,311,572, Cl. 204-158.00R.

Bonnet, Jaques; and Lebet, Jean-Pierre, to Baumgartner Papier S.A. Method for aromatizing tobacco smoke. 4,311,156, Cl. 131-274.000.

Boone, David E.; and Jezl, James L., to Standard Oil Company (Indiana). Olefin polymerization catalyst. 4,311,612, Cl. 252-429.00B.

Borg-Warner Corporation: *See—*
Miller, Donald K., 4,311,498, Cl. 62-181.000.

Borror, Alan L.; Cincotta, Louis; Foley, James W.; and Kampe, Marcis M., to Polaroid Corporation. Benzisothiazole and naphtho-1,2-thiazine compounds. 4,311,839, Cl. 544-135.000.

Bottger, Uta: *See—*
Zaschke, Horst; Demus, Dietrich; Wiegeleben, Adalbert; and Bottger, Uta, 4,311,610, Cl. 252-299.610.

Bounds, William E. Condiment grater. 4,311,283, Cl. 241-95.000.

Bovenkerk, Harold P.; and Kibler, Gordon M., to General Electric Company. Diamond and cubic boron nitride abrasive compacts using size selective abrasive particle layers. 4,311,490, Cl. 51-307.000.

Bower, Lewis R. B.; Scarfe, Arthur; and Smith, John C., to Fletcher Sutcliffe Wild Limited. Mine roof support. 4,311,417, Cl. 405-297.000.

Boyer, Lawrence A., to RCA Corporation. Magnetic variable capacitor. 4,312,025, Cl. 361-289.000.

Boykin, John R., to Westinghouse Electric Corp. Coherent phase shift keyed demodulator for power line communication systems. 4,311,964, Cl. 329-104.000.

Brad Ragan, Inc.: *See—*
Clayton, Andrew R., 4,311,182, Cl. 157-13.000.

Bradley, Philip E.; and Valentine, Gordon. Table top hockey game. 4,311,309, Cl. 273-85.00B.

Bradshaw, Paul C., to Clark, Dale W., a part interest. Tuck pointing gun with flexible plunger. 4,311,258, Cl. 222-391.000.

Brandenstein, Manfred: *See—*
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; Ernst, Horst M.; and Schido, Friedrich, 4,311,348, Cl. 308-6.00C.

Brandi, Alfredo, to Compagnia Italiana Forme Acciaio S.p.A. Truck mixer. 4,311,396, Cl. 366-51.000.

Bratton, Raymond J.; and Andersson, Clarence A., to Westinghouse Electric Corp. Transpiration cooled ceramic blade for a gas turbine. 4,311,433, Cl. 416-97.00A.

Braun AG: *See—*
Gahler, Egon, 4,311,372, Cl. 354-33.000.

Braun, William E., Jr.: *See—*
Rucktenwald, Thomas E.; Braun, William E., Jr.; Lazare, Louis S.; Lin, Sharming; and Melcher, Byron, 4,311,076, Cl. 84-1.030.

Braus, Harry, to National Distillers & Chemical Corp. Acetal polymer. 4,311,825, Cl. 528-232.000.

Braye, Emile H.; and Ollivier, Jean-Marie, to Sanofi. Process for the preparation of thieno[3,2-c]pyridine. 4,311,845, Cl. 546-114.000.

Breckel, Werner; and Wurst, Bert, to Robert Bosch GmbH. Pulse amplifier with zero crossing point detection. 4,311,924, Cl. 307-354.000.

Breitenbach, Otto, to Kabel-und Metallwerke Gutehoffnungshutte AG. Method of making a stator for linear motor. 4,310,966, Cl. 29-596.000.

Breveteam S.A.: *See—*
Mueller, Jean-Pierre; and Raemy, Marius, 4,311,542, Cl. 156-84.000.

Bricmont & Associates, Inc.: *See—*
Kletch, Stanley J., 4,311,456, Cl. 432-30.000.

Bridgestone Tire Company Limited: *See—*
Hayakawa, Toshio; and Yoshida, Shoji, 4,311,179, Cl. 152-209.00R.
Yazaki, Susumu; and Matsumura, Takeshi, 4,311,392, Cl. 356-375.000.

Bridgman, Henry. Vacuum curet having an improved curetting opening. 4,311,140, Cl. 128-276.000.

Brinkman, Gerrit E., to Alfa-Laval S.A. Cheese-draining apparatus. 4,311,087, Cl. 99-456.000.

British-American Tobacco Company Limited: *See—*
Hewitt, Sidney J.; Ozamiz, Juan M.; and Yallup, Albert E., 4,311,957, Cl. 324-58.50R.

British Gas Corporation: *See—*
Stoves, Derek; Hawkins, Roger W.; and Smelt, Arthur B., 4,311,167, Cl. 137-454.200.

British Petroleum Company Limited, The: *See—*
Sutton, Gordon W., 4,311,278, Cl. 239-419.300.
Webb, Michael G., 4,311,109, Cl. 114-220.000.

Brockway Glass Company, Inc.: *See—*
Dembicki, Michael T.; and Poad, William J., 4,311,247, Cl. 215-232.000.

Brooks, Richard J.: *See—*
Brucato, Albert; and Brooks, Richard J., 4,311,552, Cl. 162-5.000.

Brooksbank, Wallace R. Leather belts or aprons for textile machines. 4,311,756, Cl. 428-282.000.

Brown, David S. Filter screen for whirlpool apparatus. 4,311,592, Cl. 210-416.200.

Brown, Gilbert, to Edward Webster Limited. Container for lipstick and like products. 4,311,402, Cl. 401-78.000.

Brown, Joseph E.; Gamble, Charles R.; and Norman, Frank, to National Research Development Corporation. Dynamic braking of A.C. motors. 4,311,948, Cl. 318-759.000.

Brown, Peter S.; and Tibbetts, Samuel H. Flexible couplings. 4,311,028, Cl. 64-28.00R.

Brubaker, Fred A., Jr. Rodent and animal trap. 4,310,984, Cl. 43-61.000.

Brucato, Albert; and Brooks, Richard J., to Chemithon Corporation, The. Deinking of newsprint. 4,311,552, Cl. 162-5.000.

Brueckner, Gerald G.; and Cantrell, Edward. Apparatus to assist leg venous and skin circulation. 4,311,135, Cl. 128-24.00R.

Brueggemann, Walter H.; and Meteer, Charles L., to Ferro Corporation. Moldable sound control composite and product. 4,311,751, Cl. 428-212.000.

Brugger, Karl; and Schwarz, Josef, to Lingl Corporation. Method and apparatus for cutting brick mouldings from a clay strip. 4,311,073, Cl. 83-23.000.

Brumfield, Robert C., to Biomedics, Inc. Toroidal flow blood reactor. 4,311,589, Cl. 210-177.000.

Brunn, Oswald. Combination furniture. 4,311,337, Cl. 297-249.000.

Brunner, Hans-Peter; Caldor, Thomas; and Orgler, Helmut, to BBC Brown, Boveri & Company, Limited. Strand-separation arrangement and a method for separating the strands of a multi-conductor electrical cable. 4,311,871, Cl. 174-74.00A.

Bruns, Klaus: *See—*
Schaper, Ulf-Armin; and Bruns, Klaus, 4,311,616, Cl. 252-522.00R.

Brush, Douglas J., to GTE Automatic Electric Labs Inc. AC Supervisory signal detector circuit. 4,311,879, Cl. 179-18.0AH.

Bryson, Robert C.: *See—*
Baker, John C.; Finley, Richard O.; Stanwood, David A.; and Bryson, Robert C., 4,310,946, Cl. 15-363.000.

Buckley, Galen L.; and Martin, Harold W., to Pyramid Optical, Inc. Universally adjustable ranging target and retro-reflector housing bracket. 4,311,382, Cl. 356-5.000.

Buddecke, Donald B.: *See—*
Lyons, William C.; Rofer-DePoorter, Cheryl K.; Buddecke, Donald B.; and Zublin, Edward A., 4,311,340, Cl. 299-4.000.

Buehler, Robert J.; Chan, Teresa H.; and Lim, Franklin, to Damon Corporation. Test set and method for the determination of free hormones. 4,311,690, Cl. 424-1.000.

Buerger, Eddy C. Post footing bracing and spacing apparatus. 4,311,300, Cl. 256-1.000.

Bugaut, Andree; Genet, Alain R.; and Dossou, Koovi G., to L'Oreal. Paraphenylenediamines substituted at position 2 of the benzene ring. 4,311,478, Cl. 8-407.000.

Bugl, Erwin; Griesshammer, Rudolf; Lorenz, Helmut; Hamster, Helmut; and Koppl, Franz, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Method for the deposition of pure semiconductor material. 4,311,545, Cl. 156-613.000.

Buhr, Gerhard; and Ruckert, Hans, to Hoechst Aktiengesellschaft. Radiation-sensitive mixture and process for the production of relief images. 4,311,782, Cl. 430-270.000.

Buik, Dirk A.; and Tietjens, Eduard W., to U.S. Philips Corporation. Shaving apparatus. 4,310,968, Cl. 30-34.200.

Builders Concrete, Inc.: *See—*
Sluys, Wesley W., 4,311,413, Cl. 405-219.000.

Bull & Roberts, Inc.: *See—*
Walsh, John M., III, 4,311,174, Cl. 141-383.000.

Burchiel, Scott W.; Crockford, David R.; and Rhodes, Buck A., to Serono Laboratories Inc.; and University Patents Inc. Composition and method for cancer detection in humans. 4,311,688, Cl. 424-1.000.

Burke, Greg M., to Optical Techniques International, Inc. Photo-optical keyboards. 4,311,990, Cl. 340-365.00P.

Burlington Industries, Inc.: *See—*
Hill, Berlie R., 4,311,540, Cl. 156-73.100.
London, Joe F., Jr.; and Pugh, Charles D., 4,311,000, Cl. 57-6.000.

Burroughs Corporation: *See—*
Somlyody, Arpad, 4,311,361, Cl. 350-267.000.

Burroughs Wellcome Co.: *See—*
Snyder, Solomon H., 4,311,685, Cl. 424-1.000.

Bush Boake Allen Limited: *See—*
Ansari, Hifzur R.; Isaac, Benjamin O.; and Wagner, Horst R., 4,311,617, Cl. 252-522.00R.

Buter, Roelof, to Akzo NV. Thixotropic coating composition. 4,311,622, Cl. 260-18.0EP.

Buzzi, Riccardo. Sewing machine. 4,311,105, Cl. 112-199.000.

Byers, David J. Switching waveform synthesiser for polyphase static inverters. 4,312,030, Cl. 363-41.000.

BYK Gulden Lomberg Chemische Fabrik GmbH: *See—*
Schaefer, Hartmann, 4,311,700, Cl. 424-248.540.

C & K Components, Inc.: *See—*
Henley, Roger; and Reynolds, Blake W., 4,311,884, Cl. 200-5.00R.

Caldor, Thomas: *See—*
Brunner, Hans-Peter; Caldor, Thomas; and Orgler, Helmut, 4,311,871, Cl. 174-74.00A.

California Institute of Technology: *See—*
Humphrey, Marshall F.; Ramohalli, Kumar N. R.; and Dowler, Warren L., 4,311,630, Cl. 260-38.000.

Camos, Arturo, to SAFFA S.p.A. Device for limiting the gas flow in a discharge valve for gas lighters and method. 4,311,450, Cl. 431-344.000.

Camp, Larry A.: *See—*
Lauersdorf, Duane H.; and Camp, Larry A., 4,311,460, Cl. 432-247.000.

Campbell, Guy M.: *See—*
Bench, Stephen M.; Thibodeau, Paul H.; Campbell, Guy M.; and Stump, Theodore M., 4,312,064, Cl. 370-71.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Montminy, Joseph G. B.; and Chevrette, Paul C., 4,312,015, Cl. 358-139.000.

Canadian Liquid Air Ltd./Air Liquide Canada Ltee: *See—*
Savard, Guy; and Lee, Robert G. H., 4,311,518, Cl. 75-59.000.

Cancelliere, Michael: *See—*
Messina, Joseph, 4,311,464, Cl. 434-74.000.

Cannizzaro, Joseph; and Winston, Laura. Partial-coring device. 4,310,969, Cl. 30-113.100.

Canon Kabushiki Kaisha: *See—*
Kadowaki, Hidejiro; Kurosaki, Yasuhide; Aoki, Takao; and Iwami, Naoki, 4,311,778, Cl. 430-54.000.
Kohtani, Yutaka, 4,311,369, Cl. 352-91.00C.

Cantrell, Edward: *See—*
Brueckner, Gerald G.; and Cantrell, Edward, 4,311,135, Cl. 128-24.00R.

Capel, Antoine, to Organisation Europeenne de Recherches Spatiales. Electric modulator apparatus with synchronized conductance control mode. 4,311,954, Cl. 323-222.000.

Caratsch, Hans-Peter. Tunnel furnace for fabricating plate-like flat structures, especially printed circuit boards coated at both sides with a curable material. 4,311,458, Cl. 432-121.000.

Carlson, Edwin S., to ACF Industries, Incorporated. Low profile tank car ball valve. 4,311,298, Cl. 251-144.000.

Carpenter, Bruce N.: *See—*
Tinch, David H.; Carpenter, Bruce N.; and Eliahou, Elie S., 4,312,040, Cl. 364-422.000.

Carpenter, David V.: *See—*
Rackley, Ray A.; and Carpenter, David V., 4,311,447, Cl. 431-7.000.

Carpenter, Dennis O.; and Ceola, Robert E., to Boeing Company, The. Automated aircraft radio navigation simulator. 4,311,466, Cl. 434-242.000.

Carpentier, Eugene A.: *See—*
Krueger, James E.; and Carpentier, Eugene A., 4,311,694, Cl. 424-180.000.

Carrier Corporation: *See—*
Tobin, Curtis L.; and Ciarlei, Joseph A., 4,311,020, Cl. 62-324.600.

Carver, Vicki C.: *See—*
United States of America, National Aeronautics and Space Administration; Taylor, Larry T.; St. Clair, Anne K.; Carver, Vicki C.; and Furtsch, Thomas A., 4,311,615, Cl. 252-514.000.

Casey, Donald J.; and Zavisza, Daniel M., to Formica Corporation. No-overlay decorative laminates. 4,311,748, Cl. 428-204.000.

Casio Computer Co., Ltd.: *See—*
Yamakita, Tooru, 4,312,037, Cl. 364-405.000.

Castanier, Philippe, to Superior, S.A. Suitcase with rollers. 4,311,222, Cl. 190-18.00A.

Catanese, Carmen A.: *See—*
Bloom, Stanley; and Catanese, Carmen A., 4,311,944, Cl. 315-375.000.

Cather, Douglas A., Jr., to Garlock Inc. Shaft seal and method. 4,311,316, Cl. 277-1.000.

Cato Research Corporation: *See—*
Kruesi, Paul R.; and Frahm, Veryl H., Jr., 4,311,520, Cl. 75-80.000.

Cavallarin, Fiore B., to Closeform S.r.l. Machine for manufacturing curvilinear convex wooden frames. 4,311,176, Cl. 144-268.000.

Cavero, Icilio A. G.: *See—*
Manoury, Philippe M. J.; Cavero, Icilio A. G.; Najer, Henry; and Giudicelli, Don P. R. L., 4,311,708, Cl. 424-330.000.

CEA of Canada, Ltd.: *See—*
Begin, Pierre, 4,311,452, Cl. 431-352.000.

Celotex Corporation, The: *See—*
Skowronski, Michael J.; and DeLeon, Alberto, 4,311,801, Cl. 521-110.000.

Centro Ricerche Fiat S.p.A.: *See—*
Manfre', Giovanni; and Pellegrini, Vittorio, 4,311,506, Cl. 65-59.600.

Ceola, Robert E.: *See—*
Carpenter, Dennis O.; and Ceola, Robert E., 4,311,466, Cl. 434-242.000.

Chamberlin, David A. In-motion starting gate. 4,311,116, Cl. 119-15.50A.

Champion International Corporation: *See—*
Austin, John J., 4,311,233, Cl. 206-45.250.
Montealegre, James, 4,311,269, Cl. 229-28.00R.

Chan, Cheuk-Wah: *See—*
Frank, Howard; Swafford, John W., Jr.; Farazi, Perry; Patel, Arvind M.; Chan, Cheuk-Wah; Dohnal, Edward J.; Wang, Clark S.; and Mehta, Ashokkumar D., 4,312,043, Cl. 364-551.000.

Chan, John Y.; and Barnes, John J., to Fairchild Camera & Instrument Corp. Voltage protection circuit for binary data-storage device. 4,311,930, Cl. 307-575.000.

Chan, Teresa H.: *See—*
Buehler, Robert J.; Chan, Teresa H.; and Lim, Franklin, 4,311,690, Cl. 424-1.000.

Chang, Albert Y.; and Pandya, Punit J., to International Business Machines Corporation. Current switch emitter follower latch having output signals with reduced noise. 4,311,925, Cl. 307-455.000.

Chang, Tsung K., to General Electric Company. Refrigerator cabinet construction. 4,311,351, Cl. 312-236.000.

Chapman, Charles C., to Phillips Petroleum Company. Separation of products of HF alkylation. 4,311,866, Cl. 585-719.000.

Charland, Leo. Fluid mixing valve. 4,311,160, Cl. 137-111.000.

Chasar, Dwight W., to B. F. Goodrich Company, The. Process for preparation of (hydrocarbonthio)oxamides. 4,311,647, Cl. 260-453.0RW.

Chatterjea, Probir K., to International Harvester Company. Modulated transmission with converter and modulator-load-piston which fully resets and dumps converter. 4,311,068, Cl. 74-733.000.

Chavannes, Marc A. Corrugated paper board. 4,311,746, Cl. 428-110.000.

Chem Systems Inc.: *See—*
Jung, John A.; and Peress, Jimmy, 4,311,851, Cl. 560-233.000.

Chemap AG: *See—*
Katinger, Hermann; and Scheirer, Winfried, 4,311,798, Cl. 435-286.000.

Chemie Linz Aktiengesellschaft: *See—*
Golser, Leopold; and Woisetschlager, Helmut, 4,311,802, Cl. 521-133.000.

Chemithon Corporation, The: *See—*
Brucato, Albert; and Brooks, Richard J., 4,311,552, Cl. 162-5.000.

Chen, Nai-Yuen; Miale, Joseph N.; and Reagan, William J., to Mobil Oil Corporation. Manufacture of hydrocarbons from oxygenates. 4,311,865, Cl. 585-640.000.

Chevrette, Paul C.: *See—*
Montminy, Joseph G. B.; and Chevrette, Paul C., 4,312,015, Cl. 358-139.000.

Chevron Research: *See—*
Ziman, Stephen D., 4,311,849, Cl. 549-63.000.

Chi, Frank K., to Dow Corning Corporation. Method for rendering non-ferrous metals corrosion resistant. 4,311,738, Cl. 427-387.000.

Chiang, John S. C.; and Moore, William S., to FMC Corporation. Method of regenerating phosphoric acid extraction solvent. 4,311,681, Cl. 423-321.00S.

Chieffo, Joseph M. Amusement device. 4,310,987, Cl. 46-251.000.

Chin, Gilbert Y.; Green, Martin L.; Sherwood, Richard C.; and Wernick, Jack H., to Bell Telephone Laboratories, Incorporated. Low-cobalt Fe-Cr-Co permanent magnet alloy processing. 4,311,537, Cl. 148-108.000.

Christensen, Burton G.; Leanza, William J.; Shih, David H.; and Wildonger, Kenneth J., to Merck & Co., Inc. Substituted N-methylene derivatives of thienamycin. 4,311,704, Cl. 424-274.000.

Christenson, Lowell B., to Engineered Piling Systems, Inc. Apparatus and method for increasing the load bearing strength of a pile. 4,311,415, Cl. 405-228.000.

Chu, Chang K.: *See—*
Bartko, John; Tarneja, Krishan S.; Chu, Chang K.; and Schlegel, Earl S., 4,311,534, Cl. 148-1.500.

Chung, Daniel A., to Goodyear Tire & Rubber Company, The. Polyurethane shock absorbing unit and said polyurethane. 4,311,765, Cl. 428-425.800.

Chupp, John P., to Monsanto Company. Process for producing N-(halomethyl) acyl-amides. 4,311,858, Cl. 564-214.000.

Ciarlei, Joseph A.: *See—*
Tobin, Curtis L.; and Ciarlei, Joseph A., 4,311,020, Cl. 62-324.600.

Ciba-Geigy AG: *See—*
Bersier, Jacques; Jager, Horst; and Schwander, Hansrudolf, 4,311,565, Cl. 204-73.00R.
Steiger, Rolf; and Reber, Jean F., 4,311,786, Cl. 430-411.000.

Ciba-Geigy Corporation: *See—*
Beffa, Fabio, 4,311,641, Cl. 260-145.00A.
Bohner, Beat; and Rempfler, Hermann, 4,311,513, Cl. 71-92.000.
Eckhardt, Claude; and von Rutte, Richard, 4,311,605, Cl. 252-102.000.
Nikles, Erwin, 4,311,820, Cl. 526-265.000.
Price, Ian M.; and Skelly, James K., 4,311,480, Cl. 8-527.000.
Szczepanski, Henry; Rohr, Otto; and Rempfler, Hermann, 4,311,514, Cl. 71-94.000.

Cincotta, Louis: *See—*
Borror, Alan L.; Cincotta, Louis; Foley, James W.; and Kampe, Marcis M., 4,311,839, Cl. 544-135.000.

Citizen Watch Company Limited: *See—*
Kume, Kazunari, 4,312,057, Cl. 368-63.000.
Nishimura, Katsuo, 4,312,056, Cl. 368-62.000.
Tsuchiya, Hidetaka; and Nakajima, Kouichi, 4,311,893, Cl. 200-340.000.

Civardi, Frank P., to Inmont Corporation. Laminating. 4,311,745, Cl. 428-91.000.

CKD Corporation: *See—*
Hayakawa, Masatoshi; and Ogi, Koei, 4,311,457, Cl. 432-222.000.

Clark, Alan D.; Harvey, Richard P.; and Leming, Colin A., to J. H. Dallmeyer Limited. Image focusing system. 4,311,366, Cl. 350-445.000.

Clark, Dale W.: *See—*
Bradshaw, Paul C., 4,311,258, Cl. 222-391.000.

Clark, Deborah M.: *See—*
Workman, Erwin F., Jr.; and Clark, Deborah M., 4,311,482, Cl. 23-230.00B.

Clark, Ronald J., to Sealed Motor Construction Co. Ltd. Axial gap electric motors. 4,311,937, Cl. 310-268.000.

Clark, Wallace; and Goldstein, Albert S., Jr., to Oncor Corporation. Motor/pump transmission construction for a Moineau type apparatus. 4,311,443, Cl. 418-48.000.

Clavelloux, Noel; and Peynaud, Francois, to Thomson-CSF. Device for measuring sea currents at great depths. 4,311,045, Cl. 73-170.00A.

Clay, William L.: *See—*
Konrad, William L.; and Clay, William L., 4,311,929, Cl. 307-529.000.

Clayton, Andrew R., to Brad Ragan, Inc. Tire tread grooving apparatus and method. 4,311,182, Cl. 157-13.000.

Clearwater, Russell A., to Talon, Inc. Method for operating on continuous slide fastener chain. 4,310,961, Cl. 29-408.000.

Clinton, Albert J., deceased (by Clinton, Cheryl L., administrator); and American Fletcher National Bank and Trust Company, special administrator, to Eli Lilly and Company. Anticoccidial formulation and method. 4,311,710, Cl. 424-330.000.

Clinton, Cheryl L., administrator: *See—*
Clinton, Albert J., deceased; and American Fletcher National Bank and Trust Company, special administrator, 4,311,710, Cl. 424-330.000.

Closeform S.r.l.: *See—*
Cavallarin, Fiore B., 4,311,176, Cl. 144-268.000.

CMI Corporation: *See—*
Verros, James M., 4,311,322, Cl. 280-656.000.

Coad, George L.; Shaw, R. Howard; and Hutchinson, Martin A., to Varian Associates, Inc. Wafer transfer system. 4,311,427, Cl. 414-217.000.

Cobb, William R., to Schroeder Brothers Corporation. Drill steel guide. 4,311,347, Cl. 308-3.900.

Coetsier, Paul, to Etablissements M. Muller & Cie. Method for checking wheel alignment of front and rear wheel systems of automotive vehicles and an apparatus for carrying out said method. 4,311,386, Cl. 356-155.000.

Cohen, Georges: *See—*
Rojey, Alexandre; and Cohen, Georges, 4,311,019, Cl. 62-101.000.

Cole, Robert; and Stephenson, James E., to Albright & Wilson Ltd. Flameproofing agents. 4,311,855, Cl. 564-12.000.

Colgate Palmolive Company: *See—*
Kaeser, James A., 4,311,606, Cl. 252-135.000.
Kaeser, James A., 4,311,607, Cl. 252-140.000.

Colt Industries Operating Corp: *See—*
Cowles, Warren H., 4,311,126, Cl. 123-438.000.

Combustion Engineering, Inc.: *See—*
Verdone, Gary F., 4,311,560, Cl. 376-225.000.

Commissariat a l'Energie Atomique: *See—*
Langevin, Bernard, 4,311,163, Cl. 137-315.000.
Robin, Marcel, 4,311,189, Cl. 165-11.00R.

Communications Satellite Corporation: *See—*
Warner, Brady, 4,312,063, Cl. 370-68.000.

Compagnia Italiana Forme Acciaio S.p.A.: *See—*
Brandi, Alfredo, 4,311,396, Cl. 366-51.000.

Compagnie Francaise de Produits Industriels: *See—*
Schapira, Joseph; Ken, Victor; Masson, Jean C.; and Duboys, Francois J., 4,311,536, Cl. 148-6.15R.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Roux, Evelyne, 4,311,989, Cl. 340-347.0DD.

Compagnie Internationale Pour l'Informatique CII-Honeywell Bull: *See—*
Jean, Eltgen; and Alain, Jossic, 4,312,045, Cl. 364-900.000.

Compagnie Internationale pour l'Informatique CII Honeywell Bull (Societe Anonyme): *See—*
Lazzari, Jean-Pierre, 4,311,727, Cl. 427-58.000.

Comstedt, Anders, to El-Fi Innovationer AB. Method and apparatus for controlling the start of an intermittently operating pump. 4,311,438, Cl. 417-12.000.

Condon, Michael E., to E. R. Squibb & Sons, Inc. 2,3,6,7-Tetrahydro-2-thioxo-4H-oxazolo[3,2-a]-1,3,5 triazin-4-ones. 4,311,840, Cl. 544-223.000.

Condon, Michael E.: *See—*
Ondetti, Miguel A.; and Condon, Michael E., 4,311,705, Cl. 424-274.000.

Conlin, Donald B.: *See—*
Bernecker, Gunther, 4,311,128, Cl. 123-557.000.

Conner, Wayne L.; and Martin, William G., to Facet Enterprises, Inc. Axial flow gas cleaning device. 4,311,494, Cl. 55-394.000.

Connor, Robert J.: *See—*
Samek, Norbert E.; Garland, Thomas H.; and Connor, Robert J., 4,312,004, Cl. 346-1.100.

Conoco Inc.: *See—*
Mack, Mark P., 4,311,571, Cl. 204-158.00S.

Conroy, James T., to General Electric Company. Silicone resin coating composition. 4,311,763, Cl. 428-412.000.

Consolidated Foundries and Mfg. Corp.: *See—*
Hutchings, David A., 4,311,627, Cl. 260-30.40R.

Construction Forms, Inc.: *See—*
Westerlund, Herbert A.; and Westerlund, Robert E., 4,311,248, Cl. 277-206.00R.

Construction Murox, Inc.: *See—*
Thabet, Pierre J., 4,310,992, Cl. 52-309.110.

Container Corporation of America: *See—*
Gardner, Jeffrey M.; and Pieritz, John R., 4,311,100, Cl. 108-111.000.

Continental Carbon Company: *See—*
Sailors, Clyde A., Jr., 4,311,173, Cl. 141-68.000.

Continental Electronics Mfg. Co.: *See—*
Owen, Kenneth, 4,311,977, Cl. 336-69.000.

Continental Group, Inc., The: *See—*
Ravve, Abraham; and Wilt, Paxton M., 4,311,250, Cl. 220-458.000.

Cooke, Robert S.: *See—*
Dege, Gerald J.; Segal, Leon; DeBona, Bruce T.; and Cooke, Robert S., 4,311,822, Cl. 528-176.000.

Cooley, William C., to Terraspace, Inc. Apparatus for breaking rock or concrete. 4,311,343, Cl. 299-22.000.

Coombes, Daniel J.; and Seitz, Martin V., to Motorola, Inc. Digital encoder-decoder. 4,312,070, Cl. 371-40.000.

Cooperman, Michael: *See—*
Patel, Lalit; and Cooperman, Michael, 4,311,926, Cl. 307-466.000.

Corning Glass Works: *See—*
Danielson, Paul S.; and Megles, John E., Jr., 4,311,529, Cl. 501-32.000.
Herczog, Andrew, 4,311,772, Cl. 429-193.000.
Hertl, William; and Odstrchel, Gerald, 4,311,687, Cl. 424-1.000.
Nigrin, Jaroslava M., 4,311,504, Cl. 65-32.000.
Schlicker, Melvin C., 4,311,239, Cl. 206-597.000.
Spycher, Anton A.; and Damico, Dennis J., 4,311,762, Cl. 428-412.000.

Cortex Research Corporation: *See—*
Fosslien, Egil, 4,311,484, Cl. 73-864.210.

Cottman, Kirkwood S., to Goodyear Tire & Rubber Company, The. Polyphenolic esters of mercaptophenols as antioxidants. 4,311,637, Cl. 260-45.85B.

Countess York, Ltd.: *See—*
York, Alen S.; and York, Judd M., 4,310,925, Cl. 2-69.500.

Cournoyer, Richard L.; and Foley, James W., to Polaroid Corporation. Xanthene compounds. 4,311,847, Cl. 548-207.000.

Courtney, Barry G.; and Kaminski, Mitchell V., Jr., to Kaminski, Mitchell V., Jr. Micro-jejunostomy feeding tube. 4,311,148, Cl. 128-348.000.

Cowen, Geoffrey; Norton-Berry, Philip; and Steel, Margaret L., to Imperial Chemical Industries Limited. Chemical process on the surface of a rotating body. 4,311,570, Cl. 204-157.10R.

Cowles, Warren H., to Colt Industries Operating Corp. Fuel injection apparatus and system. 4,311,126, Cl. 123-438.000.

Cox, Bruce M.; and Ho, Morris D., to Halliburton Company. Mass flowmeter with sensor gain control. 4,311,054, Cl. 73-861.380.
Cox, Donald J. Elevator cleaner. 4,310,950, Cl. 19-202.000.
Cox, John A.: *See—*
Esty, Janet M.; and Cox, John A., 4,311,145, Cl. 128-303.170.
Crawford, Donald C.; and Le Taurneau, Gary M., to FMC Corporation. Article feeding mechanism. 4,311,230, Cl. 198-457.000.
Cree, Gavin M., to Radiochemical Centre Limited, The. Selenium derivatives of thyroxine and tri-iodothyronine. 4,311,853, Cl. 562-447.000.
Crepeau, Charles E.: *See—*
Mulvey, Robert F.; and Crepeau, Charles E., 4,310,996, Cl. 52-809.000.
Crescentini, Lamberto; Blackman, Webb B., Jr.; DeCaprio, Joseph D.; Fisher, William B.; Lilley, Roy J., Jr.; and Wagner, John W., to Allied Corporation. Recovery of caprolactam from nylon 6 oligomers. 4,311,642, Cl. 260-239.30A.
Crichlow, Charles A.: *See—*
Martin, Lawrence L.; Ong, Helen H.; Anderson, Vernon B.; and Crichlow, Charles A., 4,311,703, Cl. 424-263.000.
Cripe, Alan R.: *See—*
Hindin, Eugene; Cripe, Alan R.; and Cripe, Christopher A., 4,311,244, Cl. 213-86.000.
Cripe, Christopher A.: *See—*
Hindin, Eugene; Cripe, Alan R.; and Cripe, Christopher A., 4,311,244, Cl. 213-86.000.
Crockett, Charles R.; and Swafford, Jerry W., to Teccor Electronics, Inc. U-Core pulse transformer. 4,311,978, Cl. 336-92.000.
Crockford, David R.: *See—*
Burchiel, Scott W.; Crockford, David R.; and Rhodes, Buck A., 4,311,688, Cl. 424-1.000.
Crosman, Dorland L., to Louis Marx & Co., Inc. Reprojector apparatus for pinball machines. 4,311,311, Cl. 273-121.00A.
Crown Zellerbach Corporation: *See—*
Litzinger, Paul C., 4,311,115, Cl. 119-1.000.
Crownover, Joseph W., to Statnetics Laboratories Corp. Thermal adjustment of dielectric constant of hot-pressed ceramic capacitors. 4,311,455, Cl. 432-18.000.
Crump, John M. Equipment carrying and, or, securing device. 4,311,333, Cl. 294-147.000.
Cuba, Ronald R., to Gilson Brothers Company. Grass collection cart. 4,310,998, Cl. 56-202.000.
Cucci, Gerald R., to Rosemount, Inc. Vibrating beam pressure sensor. 4,311,053, Cl. 73-704.000.
Culbertson, Townley P.: *See—*
Haskell, Theodore H.; Mich, Thomas F.; Schweiss, Dietrich; and Culbertson, Townley P., 4,311,698, Cl. 424-246.000.
Cummins Engine Company, Inc.: *See—*
Reid, David L.; and Taylor, Dennis O., 4,311,041, Cl. 73-117.300.
Reid, David L.; and Taylor, Dennis O., 4,311,043, Cl. 73-119.00A.
Curtiss-Wright Corporation: *See—*
De Feo, Angelo, 4,311,166, Cl. 137-375.000.
Cutler, John H.: *See—*
Walker, Loren H.; and Cutler, John H., 4,311,951, Cl. 318-778.000.
Cutter, James W., to DFP Enterprises. Automatic processor for dental x-ray film. 4,311,380, Cl. 354-322.000.
Czernik, Daniel E.; and Moerk, John C., Jr., to Felt Products Mfg. Co. Head gasket assembly and method of making same. 4,311,318, Cl. 277-235.00B.
D.S.L. Inc.: *See—*
Lum, Albert C. H., 4,311,330, Cl. 292-210.000.
Daguet, Jacques L.: *See—*
Bellanger, Maurice G.; and Daguet, Jacques L., 4,312,062, Cl. 370-50.000.
Daicel Chemical Industries Ltd.: *See—*
Namikoshi, Hajime; and Notsu, Kazuo, 4,311,833, Cl. 536-90.000.
Daido Metal Company Ltd.: *See—*
Iijima, Yoshio, 4,310,939, Cl. 10-86.00B.
Dameret, Jean-Louis; Maximilien, Jacques; and Paret, Jacques, to Service d'Exploitation Industrielle des Tabacs et des Allumettes. Process and device for cutting out cigar wrappers from a tobacco leaf. 4,311,155, Cl. 131-280.000.
Damico, Dennis J.: *See—*
Spycher, Anton A.; and Damico, Dennis J., 4,311,762, Cl. 428-412.000.
Damon Corporation: *See—*
Buehler, Robert J.; Chan, Teresa H.; and Lim, Franklin, 4,311,690, Cl. 424-1.000.
Danchuk, William: *See—*
Reed, Kingstone L. H.; Danchuk, William; and Hatcher, Ian, 4,311,017, Cl. 62-3.000.
Danielson, Paul S.; and Megles, John E., Jr., to Corning Glass Works. Tinted opal glass. 4,311,529, Cl. 501-32.000.
Dankman, Scott; Levy, Richard C.; and McCoy, Bryan. Electronic maze game. 4,311,310, Cl. 273-109.000.
Danner, Bill A., to Fiat-Allis Construction Machinery, Inc. Track assembly hinge joint. 4,311,346, Cl. 305-11.000.
Danner, Dean W., to GTE Automatic Electric Labs Inc. Interface system isolating a subscriber subset from a telephone switching system. 4,311,875, Cl. 179-2.00A.
Dataproducts Corporation: *See—*
Taub, Howard H.; and Wolf, Peter H., 4,312,008, Cl. 346-140.00R.
David, Henry B. Blood element separation apparatus. 4,310,955, Cl. 24-248.00B.
Davies, John H.: *See—*
Davis, Royston H.; and Davies, John H., 4,311,838, Cl. 544-54.000.
Davis, Gail F.: *See—*
Douthitt, John L.; and Davis, Gail F., 4,311,395, Cl. 366-27.000.
Davis, Robert P. Portable voice communication system. 4,311,872, Cl. 179-1.00R.
Davis, Royston H.; and Davies, John H., to Shell Oil Company. Tetrahydro-2-nitrimino-2H-1,3-thiazine. 4,311,838, Cl. 544-54.000.
Davy McKee (Oil & Chemicals) Limited: *See—*
Aldridge, Dennis R., 4,311,564, Cl. 203-99.000.
Dayco Corporation: *See—*
Standley, Paul M., 4,311,474, Cl. 474-205.000.
Dayton, Birney D., to Grass Valley Group, Inc., The. Sine-squared pulse shaping circuit. 4,311,921, Cl. 307-261.000.
De Forenede Bryggerier A/S: *See—*
Gibbons, Gregory C.; and Munck, Lars, 4,311,358, Cl. 350-91.000.
De Havilland Aircraft of Canada, Limited, The: *See—*
Gilbertson, Frederick L.; Garland, Douglas B.; and Whittley, Donald C., 4,311,291, Cl. 244-211.000.
de Almagro, Ignacia, to Almagro Trading Company. Table attachment. 4,311,101, Cl. 108-152.000.
DeArmitt, Clyde B., to Diamond International Corporation. Mechanical breakup actuator. 4,311,256, Cl. 222-321.000.
Deason, Paul K. Gutter attachment. 4,311,292, Cl. 248-48.200.
DeBardi, Gary A.: *See—*
Modes, Vernon E.; Tam, Hak W.; Quinton, Wayne E.; Bailey, Alan G.; Niskanen, Robert A.; Vitez, Lou; and DeBardi, Gary A., 4,311,152, Cl. 128-641.000.
DeBona, Bruce T.: *See—*
Dege, Gerald J.; Segal, Leon; DeBona, Bruce T.; and Cooke, Robert S., 4,311,822, Cl. 528-176.000.
DeBoo, Jerome L.; and Geis, David G., to Teletype Corporation. Paper tape punch assembly. 4,311,065, Cl. 74-571.00M.
DeBose, Alfred C. Muscle man shirt. 4,310,927, Cl. 2-115.000.
DeCaprio, Joseph D.: *See—*
Crescentini, Lamberto; Blackman, Webb B., Jr.; DeCaprio, Joseph D.; Fisher, William B.; Lilley, Roy J., Jr.; and Wagner, John W., 4,311,642, Cl. 260-239.30A.
DeChant, Donald W., to Eaton Corporation. Reusable releasable fastener. 4,311,992, Cl. 340-572.000.
Dee Howard Company, The: *See—*
Finch, Thomas, 4,311,289, Cl. 244-55.000.
Deepsea Ventures, Inc.: *See—*
Latimer, John P., 4,311,342, Cl. 299-8.000.
Deere & Company: *See—*
Steilen, Ronald M.; and Schreiner, Lester D., 4,311,104, Cl. 111-85.000.
De Feo, Angelo, to Curtiss-Wright Corporation. Valve assembly for use with high temperature and high pressure fluids. 4,311,166, Cl. 137-375.000.
Dege, Gerald J.; Segal, Leon; DeBona, Bruce T.; and Cooke, Robert S., to Allied Corporation. Interfacial production of poly(ester carbonate) or polyester including acid chloride synthesis. 4,311,822, Cl. 528-176.000.
DeGrazia, Melvin G., Jr.: *See—*
Jubenville, Duncan B.; and DeGrazia, Melvin G., Jr., 4,311,157, Cl. 134-125.000.
DeJonge, Michael K., to Lear Siegler, Inc. Flight performance data computer system. 4,312,041, Cl. 364-442.000.
DeLeon, Alberto: *See—*
Skowronski, Michael J.; and DeLeon, Alberto, 4,311,801, Cl. 521-110.000.
Delta Oil Products Corporation: *See—*
Myers, Marion M.; and Tellefsen, William J., 4,311,631, Cl. 260-38.000.
Demarthe, Jean-Michel; and Solar, Serge, to Minemet Recherche. Process for the recovery of uranium contained in phosphated compounds. 4,311,676, Cl. 423-10.000.
Demazeau, Gerard; Maestro, Patrick; Plante, Theophile; Pouchard, Michel; and Hagenmuller, Paul, to Agence Nationale de Valorisation de la Recherche (ANVAR). Novel ferromagnetic chromium dioxide and rhodium dioxide material and its preparation. 4,311,770, Cl. 428-694.000.
Dembicki, Michael T.; and Poad, William J., to Brockway Glass Company, Inc. Glass container and thermoplastic closure combination. 4,311,247, Cl. 215-232.000.
deMey, Charles F.; and Young, Eugene F., to Perkin-Elmer Corporation, The. Flow-through sample cell and collecting and illuminating optics for liquid chromatography. 4,311,387, Cl. 356-318.000.
Demmin, Timothy R.; and Rogic, Milorad M., to Allied Corporation. Preparation of higher muconic acid monesters. 4,311,850, Cl. 560-131.000.
Demny, Werner; and Moltner, Hermann, to Kocks Technik GmbH & Co. Rolling mill roll and method of rolling. 4,311,033, Cl. 72-224.000.
Dempsey, Russell M.; Fragala, Anthony R.; La Conti, Anthony B.; and Enos, John F., to General Electric Company. Device for evolution of oxygen with ternary electrocatalysts containing valve metals. 4,311,569, Cl. 204-129.000.
Demus, Dietrich: *See—*
Zaschke, Horst; Demus, Dietrich; Wiegeleben, Adalbert; and Bottger, Uta, 4,311,610, Cl. 252-299.610.
de Niet, Edmond; and Rijckaert, Albert M. A., to U.S. Philips Corporation. Spectrum converter for analog signals. 4,312,073, Cl. 375-19.000.
Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Hiraoka, Hideo; Amemiya, Masaru; and Hagiwara, Hirotoshi, 4,311,941, Cl. 313-336.000.
Deptula, Richard W.: *See—*
Vink, Walter; and Deptula, Richard W., 4,311,722, Cl. 426-660.000.

Desjardins, Rene A.; and Sankewitsch, Vladimir, to Boeing Company, The. Vibration isolation system. 4,311,213, Cl. 188-380.000.

DeSoto, Inc.: *See—*
Noren, Gerry K., 4,311,827, Cl. 528-405.000.

Dessauer, Rolf, to Du Pont de Nemours, E. I., and Company. Dimers derived from unsymmetrical 2,4,5,-triphenylimidazole compounds as photoinitiators. 4,311,783, Cl. 430-270.000.

Dessy, Franz: *See—*
Birnbaum, Jay E.; Van Humbeeck, Luc; and Dessy, Franz, 4,311,707, Cl. 424-305.000.

Developak Corporation: *See—*
Evers, Jack R., 4,311,287, Cl. 242-68.300.

DeVries, Frederick W.; and Lawes, Bernard C., to Du Pont de Nemours, E. I., and Company. Restoration of uranium solution mining deposits. 4,311,341, Cl. 299-5.000.

De Vuyst, Hugo R.: *See—*
Robben, Paul J.; and De Vuyst, Hugo R., 4,310,952, Cl. 24-230.00A.

Dewey, Ray S.: *See—*
Hernandez, Sebastian; Zimmerman, Sheldon B.; Gullo, Vincent P.; and Dewey, Ray S., 4,311,693, Cl. 424-122.000.

DFP Enterprises: *See—*
Cutter, James W., 4,311,380, Cl. 354-322.000.

Diamond, Arthur D. Breast pump. 4,311,141, Cl. 128-281.000.

Diamond International Corporation: *See—*
DeArmitt, Clyde B., 4,311,256, Cl. 222-321.000.

Diedrich, Bernd; Bohm, Ludwig; and Heine, Olaf, to Hoechst Aktiengesellschaft. Ethylene copolymers and their use for the manufacture of films. 4,311,752, Cl. 428-220.000.

Dietz, Georg; and Barth, Hans-Helmut. Root filling paste for dental surgery. 4,311,528, Cl. 106-35.000.

DIT-MCO International Corporation: *See—*
Kochsmeier, Ralph W., 4,311,352, Cl. 339-18.00R.

Dixon, Jack B.: *See—*
Baldwin, Lawrence G.; Ehrlich, Burney J.; and Dixon, Jack B., 4,311,586, Cl. 210-101.000.

Dmitrovich, Alexandr A.: *See—*
Genkin, Valery A.; Dmitrovich, Alexandr A.; and Fishbein, Efim I., 4,311,524, Cl. 75-231.000.

Dohnal, Edward J.: *See—*
Frank, Howard; Swafford, John W., Jr.; Farazi, Perry; Patel, Arvind M.; Chan, Cheuk-Wah; Dohnal, Edward J.; Wang, Clark S.; and Mehta, Ashokkumar D., 4,312,043, Cl. 364-551.000.

Dolan, Stephen J., to Precision Metering, Inc. Fluid flowmeter valve. 4,311,170, Cl. 137-614.170.

Donoghue, William J., to Motorola, Inc. Memory array having improved isolation between sense lines. 4,312,047, Cl. 365-189.000.

Doring, Michael, to U.S. Philips Corporation. Ink jet printer. 4,312,010, Cl. 346-140.00R.

Doron, Arye, to Abic Ltd. Biocidal compositions. 4,311,711, Cl. 424-346.000.

Doslik, Peter R.: *See—*
Sommer, Werner; Schieber, Hans; Krause, Erich; Radel, Franz; Trumper, Werner; Rieche, Henning; Tollkuhn, Dieter; Retallick, David; Weingartner, Albin; and Doslik, Peter R., 4,311,029, Cl. 66-75.200.

Dossou, Koovi G.: *See—*
Bugaut, Andree; Genet, Alain R.; and Dossou, Koovi G., 4,311,478, Cl. 8-407.000.

Douklias, Nikolaos: *See—*
Hacker, Heinz; Aulich, Hubert; Grabmaier, Josef; and Douklias, Nikolaos, 4,311,726, Cl. 427-54.100.

Douthitt, John L.; and Davis, Gail F., to Halliburton Company. Pivoting skid blender trailer. 4,311,395, Cl. 366-27.000.

Dow Chemical Co., The: *See—*
Fultz, Duane A., 4,311,541, Cl. 156-78.000.
Tung, Lu H.; Kirkby, Larry L.; and Lyons, Charles E., 4,311,819, Cl. 526-173.000.

Dow Corning Corporation: *See—*
Chi, Frank K., 4,311,738, Cl. 427-387.000.
Kalinowski, Robert E.; and Lipowitz, Jonathan, 4,311,760, Cl. 428-391.000.
Starch, Michael S., 4,311,695, Cl. 424-184.000.

Dowler, Warren L.: *See—*
Humphrey, Marshall F.; Ramohalli, Kumar N. R.; and Dowler, Warren L., 4,311,630, Cl. 260-38.000.

Doyle, Patrick. Bar or rod or tube frame multi-position assembly clamp. 4,311,407, Cl. 403-390.000.

Draftex Development AG: *See—*
Kruschwitz, Werner, 4,311,747, Cl. 428-122.000.

Drake, Charles A.: *See—*
Murtha, Timothy P.; and Drake, Charles A., 4,311,859, Cl. 564-491.000.

Dreisbach, Francis W.: *See—*
Freeman, E. Thomas; Stump, Charles W.; and Dreisbach, Francis W., 4,311,378, Cl. 354-217.000.

Drent, Eit, to Shell Oil Company. Preparation of unsaturated ethers. 4,311,862, Cl. 568-689.000.

Dresow, Bernd: *See—*
Koppenhagen, Volker; Schlingmann, Gerhard; Dresow, Bernd; and Ebelmann, Ortrud, 4,311,643, Cl. 260-314.000.

Driver, Howard D., to Exxon Research & Engineering Co. Hybrid piston pin. 4,311,406, Cl. 403-161.000.

Drummond, Byron B. Log cutter. 4,311,175, Cl. 144-241.000.

Duboys, Francois J.: *See—*
Schapira, Joseph; Ken, Victor; Masson, Jean C.; and Duboys, Francois J., 4,311,536, Cl. 148-6.15R.

Duchateau, Georges F. M.; Pinet, Charles H. J.; and Hanot, Pierre X., to Raffinerie Tirlemontoise. Apparatus for extracting with a liquid, products which are part of solids. 4,311,673, Cl. 422-272.000.

Dudziak, Ernst; Kwauka, Gerd-Georg; Plate, Arthur; and Lubeck, Hermann, to Reinhard Mohn OHG. Method producing a bundle of paper sheets. 4,311,090, Cl. 100-3.000.

Dufour, Daniel L., to Monsanto Company. Polyblends of PVC and styrene-maleic anhydride-rubber copolymers. 4,311,806, Cl. 525-71.000.

Dujack, George M.: *See—*
Hardman, Bruce B.; and Dujack, George M., 4,311,739, Cl. 427-387.000.

Dumont, Jean-Pierre M. C.: *See—*
Eon, Christian V.; and Dumont, Jean-Pierre M. C., 4,311,051, Cl. 73-517.00R.

Dunlop Limited: *See—*
Biggs, Ian; Goy, Ronald S.; and Whitehead, Kenneth E., 4,311,547, Cl. 156-244.130.
Jackson, William L., 4,311,180, Cl. 152-330.0RF.

Dunn, Emmett L. Clamping apparatus. 4,311,038, Cl. 73-49.800.

du Pont, Anthony A., to Rotoflow Corporation. Gas compression system and method. 4,311,004, Cl. 60-39.050.

Du Pont de Nemours, E. I., and Company: *See—*
Adams, John B., Jr., 4,311,696, Cl. 424-226.000.
Dessauer, Rolf, 4,311,783, Cl. 430-270.000.
DeVries, Frederick W.; and Lawes, Bernard C., 4,311,341, Cl. 299-5.000.
Fan, Roxy N., 4,311,784, Cl. 430-271.000.
Ganfield, David J.; Hunkapiller, Michael W.; Knight, Ernest, Jr.; and Korant, Bruce D., 4,311,639, Cl. 260-112.50R.
Gumprecht, William H., 4,311,863, Cl. 570-170.000.
Irwin, Howard D., 4,311,098, Cl. 105-226.000.
Middleton, William J., 4,311,651, Cl. 260-543.00H.
Mollison, Alistair N.; and Zboril, Vaclay G., 4,311,816, Cl. 526-116.000.
Rummel, Mitzie K., 4,311,755, Cl. 428-312.600.
Saltzman, Robert S.; and Williams, James W., 4,311,485, Cl. 23-230.00R.
Vassiliou, Eustathios, 4,311,634, Cl. 260-42.270.

Duprez, Daniel: *See—*
Grand, Michel; and Duprez, Daniel, 4,311,614, Cl. 252-466.0PT.

Dupuis, Walter A.: *See—*
Resnick, Theodore A.; and Dupuis, Walter A., 4,311,913, Cl. 250-409.000.

Durkoppwerke GmbH: *See—*
Hanneman, Franz, 4,311,106, Cl. 112-313.000.

Dybas, Richard A.; Grier, Nathaniel; and Witzel, Bruce E., to Merck & Co., Inc. Loweralkyl substituted diphenyl polyamine as an antimicrobial agent. 4,311,709, Cl. 424-330.000.

Dyna-Tech Corp.: *See—*
Stratton, Richard L., 4,311,915, Cl. 250-561.000.

Dynchik, Yan G.: *See—*
Lebedev, Vladimir M.; Dynchik, Yan G.; Kosarev, Nikolai T.; Tanin-Shakhov, Vladilen S.; and Tarasov, Vladimir S., 4,311,200, Cl. 172-826.000.

Dziemba, Peter: *See—*
Poehler, Hermann; and Dziemba, Peter, 4,311,370, Cl. 353-27.00R.

E.G.O. Elektro-Gerate, Blanc und Fischer: *See—*
Goessler, Gerhard, 4,311,899, Cl. 219-461.000.

E. R. Squibb & Sons, Inc.: *See—*
Condon, Michael E., 4,311,840, Cl. 544-223.000.
Krapcho, John, 4,311,697, Cl. 424-240.000.
Moniot, Jerome L.; Fox, Rita T.; Sprague, Peter W.; and Haslanger, Martin F., 4,311,644, Cl. 260-346.220.
Ondetti, Miguel A.; and Condon, Michael E., 4,311,705, Cl. 424-274.000.

Eagle Comtronics, Inc.: *See—*
Reddy, Prabhakara, 4,311,974, Cl. 333-112.000.

Eastman Kodak Company: *See—*
Luckey, George W.; and Towers, Christine M., 4,311,487, Cl. 23-305.0RE.
Matteson, Lawrence J., 4,311,377, Cl. 354-217.000.
Regan, Michael T., 4,311,775, Cl. 430-37.000.
Wu, Tai-Wing, 4,311,665, Cl. 422-56.000.

Eaton Corporation: *See—*
DeChant, Donald W., 4,311,992, Cl. 340-572.000.
Garrett, Wayne H.; and Zbikowski, Ted, 4,311,216, Cl. 188-18.00A.
Gee, Thomas A.; and Speranza, Donald, 4,311,985, Cl. 340-58.000.

Ebauches SA: *See—*
Luscher, Jakob; and Rusznyak, Andreas, 4,311,923, Cl. 307-304.000.

Ebelmann, Ortrud: *See—*
Koppenhagen, Volker; Schlingmann, Gerhard; Dresow, Bernd; and Ebelmann, Ortrud, 4,311,643, Cl. 260-314.000.

Eberhardt, H. Alfred, to Hale Fire Pump Company. Pump. 4,311,440, Cl. 417-360.000.

Eckhardt, Claude; and von Rutte, Richard, to Ciba-Geigy Corporation. Compositions for treating textiles. 4,311,605, Cl. 252-102.000.

Eckstein, Konrad, to Hermann Wangner GmbH & Co. KG. Multi-layer spliced drainage sieve belt and method for splicing same. 4,311,172, Cl. 139-383.00A.

Ecodyne Corporation: *See—*
Weis, Frank G., 4,311,281, Cl. 241-46.00R.

Edward Webster Limited: *See—*
Brown, Gilbert, 4,311,402, Cl. 401-78.000.
Egberg Patents (Pty.) Limited: *See—*
Bergstrom, Otto T., 4,311,585, Cl. 209-211.000.
Ehrentraut, Heinz: *See—*
Peters, Klaus-Jurgen; Stiefel, Peter; and Ehrentraut, Heinz, 4,311,168, Cl. 137-549.000.
Ehrlich, Burney J.: *See—*
Baldwin, Lawrence G.; Ehrlich, Burney J.; and Dixon, Jack B., 4,311,586, Cl. 210-101.000.
Eichler, Dieter. Swimming shoe for breast stroke. 4,310,938, Cl. 9-309.000.
Eimer, Klaus; Thal, Heinz; and Mindel, Dieter, to Ludwig Taprogge Reinigungsanlagen fur Rohren-Warmeaustauscher. Filter for separating solid bodies from a fluid stream. 4,311,591, Cl. 210-405.000.
Eisenberg, Arnold J.; Greene, Neil E.; and Glaser, Hellmut I., to Owens-Corning Fiberglas Corporation. Apparatus and method for production of mineral fibers. 4,311,499, Cl. 65-1.000.
Eka AB: *See—*
Akerlund, Sven G.; and Hook, Jan-Erik, 4,311,553, Cl. 162-23.000.
Ekstrom Industries, Inc.: *See—*
Robinson, Darrell; and Bell, John C., 4,311,354, Cl. 339-36.000.
El-Fi Innovationer AB: *See—*
Comstedt, Anders, 4,311,438, Cl. 417-12.000.
Elevator Equipment Co.: *See—*
Simpson, Elmer J., 4,311,212, Cl. 187-29.00A.
Eley, James M.; and Joyce, Arthur B., to Tyrone Hydraulics, Inc. Contaminant resistant gear pumps and motors with wear inserts. 4,311,445, Cl. 418-132.000.
Elf Union: *See—*
Grand, Michel; and Duprez, Daniel, 4,311,614, Cl. 252-466.0PT.
Eli Lilly and Company: *See—*
Bach, Nicholas J.; and Kornfeld, Edmund C., 4,311,844, Cl. 546-84.000.
Clinton, Albert J., deceased; and American Fletcher National Bank and Trust Company, special administrator, 4,311,710, Cl. 424-330.000.
Webber, J. Allan, 4,311,837, Cl. 544-26.000.
Eliahou, Elie S.: *See—*
Tinch, David H.; Carpenter, Bruce N.; and Eliahou, Elie S., 4,312,040, Cl. 364-422.000.
Elias, Josef. Reuseable portable firewall. 4,311,199, Cl. 169-48.000.
Elliott, Alton D., Jr. Cable lasher. 4,311,299, Cl. 254-134.3CL.
Ellison, Lloyd W. Method and apparatus for removing foreign matter from a printing press plate cylinder. 4,311,094, Cl. 101-425.000.
Elsbett, Gunter: *See—*
Elsbett, Ludwig; and Elsbett, Gunter, 4,311,009, Cl. 60-605.000.
Elsbett, Ludwig; and Elsbett, Gunter. Internal combustion engine. 4,311,009, Cl. 60-605.000.
Eltvedt, Frank. Vacuum tube filter cover. 4,311,492, Cl. 55-158.000.
Embossed Door Corporation: *See—*
Seely, James R., 4,310,991, Cl. 49-470.000.
Emelyanov, Vyacheslav G.: *See—*
Glushko, Mikhail F.; Skalatsky, Viktor K.; Emelyanov, Vyacheslav G.; Korovainy, Sergei F.; Koroschenko, Mikhail S.; Solomkin, Leonid D.; and Stukalenko, Mikhail I., 4,311,001, Cl. 57-215.000.
Emery, Joseph: *See—*
Salopek, Albert; and Emery, Joseph, 4,311,544, Cl. 156-510.000.
Emhart Industries, Inc.: *See—*
Wagle, William E., 4,311,059, Cl. 74-116.000.
Emmegizeta Metalmeccanica Gori & Zucchi M.G.Z. S.p.A.: *See—*
Tega, Ezio, 4,311,003, Cl. 59-16.000.
Emmons, William D.; and Kaplan, Fred A., to Rohm and Haas Company. Autoxidizable compositions. 4,311,624, Cl. 260-22.0CB.
Emrich, Helmust: *See—*
Abendroth, Paul; and Emrich, Helmust, 4,311,093, Cl. 101-232.000.
Endo, Hiroshi; Baba, Kousaku; and Matsumura, Akira, to Nissan Motor Company, Ltd. Route guidance system for roadway vehicles. 4,311,876, Cl. 179-15.5ST.
Endo, Shuzo: *See—*
Saito, Tadao; Akutsu, Masao; Sugiura, Hiroaki; and Endo, Shuzo, 4,311,246, Cl. 215-100.00A.
Endowment and Research Foundation at Montana State University: *See—*
Goering, Kenneth J.; and Eslick, Robert F., 4,311,714, Cl. 426-28.000.
Energy Modification Inc.: *See—*
Gleim, William K. T., 4,311,596, Cl. 210-711.000.
Engelander, Pieter, to Beta, B.V. Pressure limiting switch for an instrument air circuit. 4,311,892, Cl. 200-81.400.
Engelhard Minerals & Chemicals Corporation: *See—*
Bartholic, David B., 4,311,579, Cl. 208-73.000.
Bartholic, David B., 4,311,580, Cl. 208-91.000.
Engineered Piling Systems, Inc.: *See—*
Christenson, Lowell B., 4,311,415, Cl. 405-228.000.
English Electric Valve Company Limited: *See—*
Pickering, Alan H.; and Rowlands, Geoffrey J., 4,311,968, Cl. 331-90.000.
Engstrom Folke: *See—*
Nieminen, Jorma J.; and Engstrom Folke, 4,311,670, Cl. 422-145.000.
Enos, John F.: *See—*
Dempsey, Russell M.; Fragala, Anthony R.; La Conti, Anthony B.; and Enos, John F., 4,311,569, Cl. 204-129.000.
Eon, Christian V.; and Dumont, Jean-Pierre M. C., to Societe Anonyme Francaise Du Ferodo. Acceleration detector for use as a decelerometer for the control of electrically operated axle brakes. 4,311,051, Cl. 73-517.00R.
Eric A. Stern: *See—*
Waddell, Richard G., 4,310,981, Cl. 42-42.00R.
Erkfritz, Donald S.; and Alfonsi, Lawrence A., to General Electric Company. Adjustable axial and radial locating wedge assemblies for an indexable insert cutting tool. 4,311,418, Cl. 407-39.000.
Ernst, Horst M.: *See—*
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; Ernst, Horst M.; and Schido, Friedrich, 4,311,348, Cl. 308-6.00C.
ESB United States, Inc.: *See—*
Smollinger, Glenn J., 4,311,920, Cl. 307-66.000.
Eslick, Robert F.: *See—*
Goering, Kenneth J.; and Eslick, Robert F., 4,311,714, Cl. 426-28.000.
Esner, Mark E.: *See—*
Lewis, John W. R.; and Esner, Mark E., 4,310,954, Cl. 24-230.00A.
Essilor International "Cie Generale d'Optique": *See—*
Blandin, Denis, 4,311,654, Cl. 264-2.300.
Esty, Janet M.; and Cox, John A., to Neomed, Inc. Disposable electrosurgical instrument. 4,311,145, Cl. 128-303.170.
Etablissements M. Muller & Cie: *See—*
Coetsier, Paul, 4,311,386, Cl. 356-155.000.
Ethyl Corporation: *See—*
Rifkin, Ellis B., 4,311,562, Cl. 203-7.000.
Evangelisti, Carlo J.: *See—*
Bantz, David F.; Evangelisti, Carlo J.; and Nelson, Robert A., 4,312,066, Cl. 371-16.000.
Evans, John R.; Fildes, Francis J. T.; and Oliver, Jean E., to Imperial Chemical Industries Limited. Process for preparing freeze-dried liposome compositions. 4,311,712, Cl. 424-365.000.
Evenson, Dale D.; and Stair, Virgil H. Vegetation cutting apparatus. 4,310,970, Cl. 30-276.000.
Evers, Jack R., to Developak Corporation. Web pay-out assembly. 4,311,287, Cl. 242-68.300.
Exterma-Germ Products Ltd.: *See—*
Fenn, David J.; and Fellows, Adrian N., 4,311,479, Cl. 8-495.000.
Exxon Production Research Company: *See—*
Barrington, Claud C., 4,311,297, Cl. 251-63.600.
Ortloff, John E.; Stelzer, Clarence F., Jr.; and Hayes, Donald R., 4,311,327, Cl. 285-136.000.
Exxon Research & Engineering Co.: *See—*
Driver, Howard D., 4,311,406, Cl. 403-161.000.
Fant, B. T.; Miller, John D.; and Ryan, D. F., 4,311,578, Cl. 208-8.0LE.
Kurth, William T.; and Andrulitis, William B., 4,311,869, Cl. 136-246.000.
Sansregret, Joseph L., 4,311,728, Cl. 427-74.000.
Fabian, Rainer, to Linde Aktiengesellschaft. Preliminary condensation of methanane in the fractionation of a gaseous mixture. 4,311,496, Cl. 62-17.000.
Fabrica Italiana Magneti Marelli, S.p.A.: *See—*
Prudenziati, Maria, 4,311,980, Cl. 338-4.000.
Facet Enterprises, Inc.: *See—*
Conner, Wayne L.; and Martin, William G., 4,311,494, Cl. 55-394.000.
Fairchild Camera & Instrument Corp.: *See—*
Chan, John Y.; and Barnes, John J., 4,311,930, Cl. 307-575.000.
Ferris, David A., 4,311,927, Cl. 307-473.000.
Falconi, Sergio. Process for the production of cooked macaroni foods and a plant with which to effect the said process. 4,311,719, Cl. 426-557.000.
Falgares, Frank. Bow playable guitar. 4,311,078, Cl. 84-314.00R.
Falk, Volker: *See—*
Weber, Jurgen; Falk, Volker; and Kniep, Claus, 4,311,854, Cl. 562-531.000.
Falomo, Lodovico, to Barzano & Zanardo. Device for the simultaneous multiple transfer of photographic paper in strip form, from roll-holder cassettes to developers. 4,311,379, Cl. 354-313.000.
Fan, Roxy N., to Du Pont de Nemours, E. I., and Company. Multilayer photosensitive solvent-processable litho element. 4,311,784, Cl. 430-271.000.
Fant, B. T.; Miller, John D.; and Ryan, D. F., to Exxon Research & Engineering Co. Liquefaction process wherein solvents derived from the material liquefied and containing increased concentrations of donor species are employed. 4,311,578, Cl. 208-8.0LE.
Farazi, Perry: *See—*
Frank, Howard; Swafford, John W., Jr.; Farazi, Perry; Patel, Arvind M.; Chan, Cheuk-Wah; Dohnal, Edward J.; Wang, Clark S.; and Mehta, Ashokkumar D., 4,312,043, Cl. 364-551.000.
Farrar, Ralph C.: *See—*
Smith, Richard L.; Farrar, Ralph C.; and Sonnenfeld, Richard J., 4,311,803, Cl. 525-53.000.
Fath, Michael A.: *See—*
Abdou-Sabet, Sabet; and Fath, Michael A., 4,311,628, Cl. 260-33.6AQ.
Faulkner, Richard D.; and McHose, Robert E., to RCA Corporation. Alkali antimonide layer on a beryllim-copper primary dynode. 4,311,939, Cl. 313-95.000.
Faust, James H., to ABC Auto Alarms, Inc. Vehicle alarm shaker device with spring damper. 4,311,891, Cl. 200-61.45R.
Fay, Bernard; Trotel, Jacques; and Frichet, Alain, to Thomson-CSF. Method for the optical alignment of designs in two near planes and alignment apparatus for performing this method. 4,311,389, Cl. 356-354.000.

Fayolle, Bernard, to Rhone-Poulenc Industries. Thermotropic alkylaromatic copolyesters. 4,311,824, Cl. 528-190.000.

Federal-Mogul Corporation: *See*—
Roberts, Arden J., 4,311,349, Cl. 308-122.000.

Felix, Kenneth A.: *See*—
Pautler, James A.; and Felix, Kenneth A., 4,312,074, Cl. 375-96.000.

Felix, Pierre; and Le Parquier, Guy, to Thomson-CSF. Mosaic of radiation detectors read by a semiconductor device and a picture pickup system comprising a mosaic of this type. 4,311,906, Cl. 250-349.000.

Fellows, Adrian N.: *See*—
Fenn, David J.; and Fellows, Adrian N., 4,311,479, Cl. 8-495.000.

Felt Products Mfg. Co.: *See*—
Czernik, Daniel E.; and Moerk, John C., Jr., 4,311,318, Cl. 277-235.00B.

Fenn, David J.; and Fellows, Adrian N., to Exterma-Germ Products Ltd. Method of indicating the presence of an impregnant in a substrate. 4,311,479, Cl. 8-495.000.

Ferris, David A., to Fairchild Camera & Instrument Corp. Transistor logic tristate device with reduced output capacitance. 4,311,927, Cl. 307-473.000.

Ferro Corporation: *See*—
Brueggemann, Walter H.; and Meteer, Charles L., 4,311,751, Cl. 428-212.000.

Fiat-Allis Construction Machinery, Inc.: *See*—
Danner, Bill A., 4,311,346, Cl. 305-11.000.

Fichera, Anthony T. Tobacco smoking inhibitor. 4,311,691, Cl. 424-48.000.

Fichtel & Sachs AG: *See*—
Heyer, Gunther; Kany, Karl; Spichala, Paul; Wossner, Felix; and Wecker, Wilhelm, 4,311,302, Cl. 267-64.230.
Lutz, Manfred, 4,311,331, Cl. 292-336.300.

Fildes, Francis J. T.: *See*—
Evans, John R.; Fildes, Francis J. T.; and Oliver, Jean E., 4,311,712, Cl. 424-365.000.

Filipowicz, Edwin A.: *See*—
Hope, Samuel N., Jr.; and Filipowicz, Edwin A., 4,311,252, Cl. 221-57.000.

Finch, Thomas, to Dee Howard Company, The. Modifications to jet aircraft having aft fuselage-mounted nacelles overlapping the wing assemblies. 4,311,289, Cl. 244-55.000.

Finlay, Susan L. Reversible running shorts. 4,310,929, Cl. 2-238.000.

Finley, Richard O.: *See*—
Baker, John C.; Finley, Richard O.; Stanwood, David A.; and Bryson, Robert C., 4,310,946, Cl. 15-363.000.

Finley, Warren T. Method and apparatus for transferring cold seawater upward from the lower depths of the ocean to improve the efficiency of ocean thermal energy conversion systems. 4,311,012, Cl. 60-641.700.

Firestone Tire & Rubber Company, The: *See*—
Hausch, Walter R., 4,311,181, Cl. 152-353.00R.

Firmenich SA: *See*—
Skorianetz, Werner; and Ohloff, Gunther, 4,311,852, Cl. 560-256.000.

Firth, William C., Jr., to Union Camp Corporation. Humate thinners for drilling fluids. 4,311,600, Cl. 252-8.50C.

Fishbein, Efim I.: *See*—
Genkin, Valery A.; Dmitrovich, Alexandr A.; and Fishbein, Efim I., 4,311,524, Cl. 75-231.000.

Fisher, William B.: *See*—
Crescentini, Lamberto; Blackman, Webb B., Jr.; DeCaprio, Joseph D.; Fisher, William B.; Lilley, Roy J., Jr.; and Wagner, John W., 4,311,642, Cl. 260-239.30A.

Fitzgerald, John; and Van Hoorn, Willem L., to U.S. Philips Corporation. Electric incandescent lamp. 4,311,940, Cl. 313-273.000.

Flaig, Hans, to Gebruder Junghans GmbH. Off set stator laminations for small rotary transducers. 4,311,934, Cl. 310-216.000.

Fletcher Sutcliffe Wild Limited: *See*—
Bower, Lewis R. B.; Scarfe, Arthur; and Smith, John C., 4,311,417, Cl. 405-297.000.

FMC Corporation: *See*—
Chiang, John S. C.; and Moore, William S., 4,311,681, Cl. 423-321.00S.
Crawford, Donald C.; and Le Taurneau, Gary M., 4,311,230, Cl. 198-457.000.
McGinley, Emanuel J., 4,311,717, Cl. 426-330.200.

Fohl, Timothy, to GTE Products Corporation. High voltage flashlamp with ignition means including a plurality of spark gap members. 4,311,453, Cl. 431-362.000.

Foley, James W.: *See*—
Borror, Alan L.; Cincotta, Louis; Foley, James W.; and Kampe, Marcis M., 4,311,839, Cl. 544-135.000.
Cournoyer, Richard L.; and Foley, James W., 4,311,847, Cl. 548-207.000.

Foller, Werner, to GESTRA-KSB Vertriebsgesellschaft mbH & Co. KG. Bimetallic controlled steam trap. 4,311,272, Cl. 236-59.000.

Fontanille, Michel: *See*—
Sigwalt, Pierre; Guyot, Patrick; and Fontanille, Michel, 4,311,818, Cl. 326-173.000.

Formica Corporation: *See*—
Casey, Donald J.; and Zavisza, Daniel M., 4,311,748, Cl. 428-204.000.
Raghava, Ram S.; and West, Wilbur W., 4,311,757, Cl. 428-323.000.
Raghava, Ram S.; and Richardson, Calvin, 4,311,804, Cl. 525-58.000.

Fort, Francois; and Zimmermann, Pierre, to Societe Anonyme dite: les Editions Filmees. Method and apparatus for the production of preforms for optical fibres. 4,311,501, Cl. 65-3.110.

Fosslien, Egil, to Cortex Research Corporation. Specimen sampling apparatus. 4,311,484, Cl. 73-864.210.

Foster, James P.; and Reed, Walter T., to Shell Oil Company. Device for combatting flies. 4,310,985, Cl. 43-131.000.

Fournier, Erick-Pierre: *See*—
Strickman, Robert L.; Fournier, Erick-Pierre; and Strickman, Melvyn B., 4,311,543, Cl. 156-224.000.

Fox, Rita T.: *See*—
Moniot, Jerome L.; Fox, Rita T.; Sprague, Peter W.; and Haslanger, Martin F., 4,311,644, Cl. 260-346.220.

Fragala, Anthony R.: *See*—
Dempsey, Russell M.; Fragala, Anthony R.; La Conti, Anthony B.; and Enos, John F., 4,311,569, Cl. 204-129.000.

Frahm, Veryl H., Jr.: *See*—
Kruesi, Paul R.; and Frahm, Veryl H., Jr., 4,311,520, Cl. 75-80.000.

Frank, Howard; Swafford, John W., Jr.; Farazi, Perry; Patel, Arvind M.; Chan, Cheuk-Wah; Dohnal, Edward J.; Wang, Clark S.; and Mehta, Ashokkumar D., to Sun Electric Corporation. Apparatus and method for determining the integrity of a distributor for an engine. 4,312,043, Cl. 364-551.000.

Franz, Helmut, to PPG Industries, Inc. Polyurethane surface treatment and resulting monomolecular layered article. 4,311,764, Cl. 428-423.100.

Franz Volkl OHG: *See*—
Volkl, Franz; Adam, Gunter; and Klose, Volker, 4,311,308, Cl. 273-73.00G.

Frappart, Pierre; Guichard, Serge; and Saint Marcoux, Roland, to L.C.C.-C.I.C.E. Compagnie Europeenne de Composants Electroniques. Ceramic power capacitor. 4,312,023, Cl. 361-243.000.

Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V: *See*—
Gold, Henning, 4,311,035, Cl. 73-1.00D.

Frech, Kenneth J.; and Tazuma, James J., to Goodyear Tire & Rubber Company, The. Method for removal of sulfur compounds from a gas stream. 4,311,680, Cl. 423-230.000.

Frederick, Louis J.; Hoke, Kenneth E.; Greene, Jerrold W.; and Miller, Stephen D., to Greene Line Mfg. Corp. Method of feeding sheets. 4,311,430, Cl. 414-786.000.

Freeman, E. Thomas; Stump, Charles W.; and Dreisbach, Francis W., to United States of America, National Aeronautics and Space Administration. Film advance indicator. 4,311,378, Cl. 354-217.000.

Freyn, Fritz; and Greier, Josef, to List, Hans. Counterbalance for an internal combustion engine. 4,311,120, Cl. 123-192.00B.

Frichet, Alain: *See*—
Fay, Bernard; Trotel, Jacques; and Frichet, Alain, 4,311,389, Cl. 356-354.000.

Fries, James E. Skating sails. 4,311,324, Cl. 280-810.000.

Frieser, Rudolf G.; and Reeber, Morton D., to International Business Machines Corp. Nucleate boiling surface for increasing the heat transfer from a silicon device to a liquid coolant. 4,312,012, Cl. 357-82.000.

Froumajou, Armand, to Automobiles Peugeot; and Societe Anonyme Automobiles Citroen. Automatically controlled transmission device, in particular for an automobile vehicle. 4,311,067, Cl. 74-718.000.

Fuji Photo Film Co., Ltd.: *See*—
Hamada, Shinji; and Imai, Masaru, 4,311,304, Cl. 271-13.000.
Ishikawa, Takatoshi, 4,311,574, Cl. 204-180.00P.
Mifune, Hiroyuki; Takada, Shunji; Akimura, Yoshitaka; and Sakai, Nobuo, 4,311,781, Cl. 430-264.000.

Fujii, Masaki; Miyabayashi, Mitsutaka; Todaka, Hironori; and Ishizaki, Yoshihiro, to Mitsubishi Petrochemical Co., Ltd. Block copolymers of propylene and 4-methyl-1-pentene. 4,311,810, Cl. 525-321.000.

Fujii, Noriomi, to Q. P. Corporation. Method and apparatus for peeling of shells of boiled eggs. 4,311,089, Cl. 99-568.000.

Fujioka, Kazumasa; and Nakayama, Wataru, to Hitachi, Ltd. Rotor for hydrogen-cooled rotary electric machines. 4,311,931, Cl. 310-55.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Imanaka, Hiroshi; Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; and Hashimoto, Masashi, 4,311,640, Cl. 260-112.50R.

Fujita, Yuichi: *See*—
Hiraiwa, Takashi; and Fujita, Yuichi, 4,311,749, Cl. 428-209.000.

Fujitsu Limited: *See*—
Abe, Sigeharu; Tamura, Hideo; and Murakami, Takayuki, 4,311,546, Cl. 156-643.000.
Murano, Kazuo; Unagami, Shigeyuki; Itoh, Yoshikazu; Amano, Fumio; and Hayashi, Tatsuki, 4,312,075, Cl. 375-106.000.

Fukuda, Hiroaki; Sasaki, Takehiko; and Mori, Hiroshi, to Sharp Kabushiki Kaisha. Charger using one or more solar batteries. 4,311,953, Cl. 320-2.000.

Fukui, Akito: *See*—
Inoue, Shigeru; Ono, Hiroshi; Fukui, Akito; and Morikawa, Haruyuki, 4,311,856, Cl. 564-67.000.

Fultz, Duane A., to Dow Chemical Co., The. Panel and method for the preparation thereof. 4,311,541, Cl. 156-78.000.

Funcik, Jack F.; Bennet, Joseph C.; Tubbs, Joseph T.; and Schneider, Thomas E., to Molex Incorporated. Apparatus for electrical harness fabrication. 4,310,967, Cl. 29-749.000.

Furtsch, Thomas A.: *See*—
United States of America, National Aeronautics and Space Administration; Taylor, Larry T.; St. Clair, Anne K.; Carver, Vicki C.; and Furtsch, Thomas A., 4,311,615, Cl. 252-514.000.
Furuhashi, Toshio: *See*—
Imai, Masumi; Takato, Masao; and Furuhashi, Toshio, 4,312,038, Cl. 364-431.120.
Furukawa, Toshio: *See*—
Nishizawa, Yoshihiko; Furukawa, Toshio; Goto, Teruo; and Onishi, Hirotsugu, 4,311,621, Cl. 260-17.200.
Gahler, Egon, to Braun AG. Computer controlled electronic flash. 4,311,372, Cl. 354-33.000.
Gaillard, Roger, to Micro-Mega, S.A. Air-water mixer for the atomizer of a dental hand piece. 4,311,169, Cl. 137-556.000.
Gaiser, Robert F., to Bendix Corporation, The. Master cylinder and proportioning valve therefor. 4,311,007, Cl. 60-562.000.
Galland, Gerald D., to Webster, Jerry H. Strap winding mechanism. 4,311,288, Cl. 242-86.50R.
Gamble, Charles R.: *See*—
Brown, Joseph E.; Gamble, Charles R.; and Norman, Frank, 4,311,948, Cl. 318-759.000.
Gambro AG: *See*—
Nylen, Ulf T. G.; and Qvarnstrom, Lars A. G., 4,311,789, Cl. 435-10.000.
Ganfield, David J.; Hunkapiller, Michael W.; Knight, Ernest, Jr.; and Korant, Bruce D., to Du Pont de Nemours, E. I., and Company. Immunogenic interferon peptides. 4,311,639, Cl. 260-112.50R.
Gardner, Jeffrey M.; and Pieritz, John R., to Container Corporation of America. Multi-shelf display stand. 4,311,100, Cl. 108-111.000.
Garland, Douglas B.: *See*—
Gilbertson, Frederick L.; Garland, Douglas B.; and Whittley, Donald C., 4,311,291, Cl. 244-211.000.
Garland, Thomas H.: *See*—
Samek, Norbert E.; Garland, Thomas H.; and Connor, Robert J., 4,312,004, Cl. 346-1.100.
Garlock Inc.: *See*—
Cather, Douglas A., Jr., 4,311,316, Cl. 277-1.000.
Garrett Corporation, The: *See*—
Parker, Kenneth O., 4,310,960, Cl. 29-157.30R.
Rackley, Ray A.; and Carpenter, David V., 4,311,447, Cl. 431-7.000.
Garrett, Wayne H.; and Zbikowski, Ted, to Eaton Corporation. Torque plate for disc brake. 4,311,216, Cl. 188-18.00A.
Gay, Michael J., to Motorola, Inc. Bias control circuit and method for use in audio reproduction system or the like. 4,311,873, Cl. 179-1.00D.
Gdovin, David P.; and Lusk, Frank J., to Singer Company, The. Simulated lights for an airfield model. 4,310,974, Cl. 434-42.000.
Gebruder Junghans GmbH: *See*—
Flaig, Hans, 4,311,934, Cl. 310-216.000.
Gebruder Sulzer A.G.: *See*—
Muller, Maurice E., 4,310,931, Cl. 3-1.913.
Gebrueder Buehler AG: *See*—
Zimmerman, Rene, 4,311,185, Cl. 164-315.000.
Gee, Thomas A.; and Speranza, Donald, to Eaton Corporation. Tire pressure monitor and deenergization circuit therefore. 4,311,985, Cl. 340-58.000.
Geis, David G.: *See*—
DeBoo, Jerome L.; and Geis, David G., 4,311,065, Cl. 74-571.00M.
General Binding Corporation: *See*—
Vercillo, Alfredo J., 4,311,549, Cl. 156-308.200.
General Electric Co.: *See*—
Balko, Edward N., 4,311,568, Cl. 204-128.000.
Bovenkerk, Harold P.; and Kibler, Gordon M., 4,311,490, Cl. 51-307.000.
Chang, Tsung K., 4,311,351, Cl. 312-236.000.
Conroy, James T., 4,311,763, Cl. 428-412.000.
Dempsey, Russell M.; Fragala, Anthony R.; La Conti, Anthony B.; and Enos, John F., 4,311,569, Cl. 204-129.000.
Erkfritz, Donald S.; and Alfonsi, Lawrence A., 4,311,418, Cl. 407-39.000.
Hardman, Bruce B.; and Dujack, George M., 4,311,739, Cl. 427-387.000.
Ishizaka, Mitsuo; and Sumida, Heiji, 4,311,737, Cl. 427-386.000.
Kelly, Peter B., 4,311,177, Cl. 144-310.00R.
Lee, Gim F., Jr., 4,311,633, Cl. 260-42.180.
Mulvey, Robert F.; and Crepeau, Charles E., 4,310,996, Cl. 52-809.000.
Pest, Jurgen, 4,312,024, Cl. 361-271.000.
Pucci, Donald G., 4,311,753, Cl. 428-251.000.
Puckette, Charles M., 4,311,922, Cl. 307-270.000.
Stevens, Edward P.; and Zabel, Jack H., 4,310,935, Cl. 5-80.000.
Walker, Loren H.; and Cutler, John H., 4,311,951, Cl. 318-778.000.
General Motors Corporation: *See*—
Knape, Richard S., 4,311,280, Cl. 239-585.000.
Plyler, Robert G.; and Yurtin, John A., 4,311,355, Cl. 339-94.00R.
General Signal Corporation: *See*—
Becker, Lanson, 4,311,006, Cl. 60-385.000.
Genet, Alain R.: *See*—
Bugaut, Andree; Genet, Alain R.; and Dossou, Koovi G., 4,311,478, Cl. 8-407.000.
Genkin, Valery A.; Dmitrovich, Alexandr A.; and Fishbein, Efim I. Sintered iron-based friction material. 4,311,524, Cl. 75-231.000.
Gephardt, Roland, to Autonomics, Inc. Complementary geometric modules. 4,310,994, Cl. 52-608.000.
Gerard, William L., to Sherwood Medical Industries Inc. Infusion device. 4,311,137, Cl. 128-214.400.
Gerjets, Heinz, to Olympia Werke Ag. Printer for producing uniformly spaced characters. 4,311,398, Cl. 400-70.000.
Gerlach, Pierre: *See*—
Benoit, Michel; Gerlach, Pierre; Grolleau, Claude; and Lartillot, Alain, 4,311,975, Cl. 333-207.000.
Gerunda, Arthur B.; and Goers, Walter E., to Swiss Aluminium Ltd. Process for producing phosphoric acid. 4,311,677, Cl. 423-18.000.
Gesellschaft fur Biotechnologische Forschung mbH: *See*—
Koppenhagen, Volker; Schlingmann, Gerhard; Dresow, Bernd; and Ebelmann, Ortrud, 4,311,643, Cl. 260-314.000.
GESTRA-KSB Vertriebsgesellschaft mbH & Co. KG: *See*—
Foller, Werner, 4,311,272, Cl. 236-59.000.
Geyer, Ludwig; and Jarauch, Franz, to Maschinenfabrik Augsburg-Nuernberg Aktiengesellschaft. Window frame for passenger vehicles. 4,311,336, Cl. 296-201.000.
Gibbons, Gregory C.; and Munck, Lars, to De Forenede Bryggerier A/S. Illumination device for fluorescence microscopes. 4,311,358, Cl. 350-91.000.
Gibson, John J.: *See*—
Lang, Frank B.; Gibson, John J.; and Ross, Michael D., 4,312,013, Cl. 358-8.000.
Gifford-Hill & Company, Inc.: *See*—
Thompson, Glen L.; and Way, Joe W., Jr., 4,311,226, Cl. 193-35.00R.
Gilbertson, Frederick L.; Garland, Douglas B.; and Whittley, Donald C., to De Havilland Aircraft of Canada, Limited, The. Nozzle structure with notches. 4,311,291, Cl. 244-211.000.
Gillette Company, The: *See*—
Wildgoose, Charles R., 4,311,234, Cl. 206-354.000.
Gilligan, Thomas J.; Smith, James E.; and Wong, Yun P., to Ampex Corporation. Magnetic core memory inhibit current driver circuit. 4,312,048, Cl. 365-195.000.
Gilligan, William H.; and Sitzmann, Michael E., to United States of America, Navy. N,N-Bis(2-fluoro-2,2-dinitroethyl)carbamate esters. 4,311,649, Cl. 260-455.00A.
Gillum, Richard R., to ARES, Inc. Dual, two stage shell feeding apparatus for guns. 4,311,081, Cl. 89-33.0SF.
Gilmour, George A., to Westinghouse Electric Corp. Passive fiber optic sonar system. 4,311,391, Cl. 356-361.000.
Gilson Brothers Company: *See*—
Cuba, Ronald R., 4,310,998, Cl. 56-202.000.
Giudicelli, Don P. R. L.: *See*—
Manoury, Philippe M. J.; Cavero, Icilio A. G.; Najer, Henry; and Giudicelli, Don P. R. L., 4,311,708, Cl. 424-330.000.
Givaudan Corporation: *See*—
Kaiser, Roman; and Lamparsky, Dietmar, 4,311,718, Cl. 426-538.000.
Krasnobajew, Victor, 4,311,860, Cl. 568-378.000.
Givens, Wyatt W., to Mobil Oil Corporation. Neutron accelerator tube having improved target section. 4,311,912, Cl. 376-109.000.
Glaab, Joseph B.; and Jeffers, Michael F., to Jerrold Electronics Corporation. Television signal switching apparatus. 4,312,016, Cl. 358-188.000.
Glabiszewski, Richard: *See*—
Nader, Max; and Glabiszewski, Richard, 4,310,932, Cl. 3-28.000.
Glaser, Hellmut I.: *See*—
Eisenberg, Arnold J.; Greene, Neil E.; and Glaser, Hellmut I., 4,311,499, Cl. 65-1.000.
Glattly, Albert D. Orthodontic apparatus for straightening teeth. 4,311,463, Cl. 433-18.000.
Gleim, William K. T., to Energy Modification Inc. Extraction of reusable water from a mineral mining process. 4,311,596, Cl. 210-711.000.
Glennon, Alfred E., to International Coatings Co., Inc. Pressure sensitive adhesives. 4,311,759, Cl. 428-345.000.
Glockler, Otto; Gunther, Dieter; Steinbrenner, Ulrich; Schulzke, Peter; and Sieber, Albrecht, to Robert Bosch GmbH. Method and apparatus for controlling the fuel supply of an internal combustion engine. 4,311,123, Cl. 123-325.000.
Glushko, Mikhail F.; Skalatsky, Viktor K.; Emelyanov, Vyacheslav G.; Korovainy, Sergei F.; Koroschenko, Mikhail S.; Solomkin, Leonid D.; and Stukalenko, Mikhail I. Method for manufacturing twisted wire products and product made by this method. 4,311,001, Cl. 57-215.000.
Gocho, Nagahiro, to Olympus Optical Company Limited. Delivering apparatus. 4,311,667, Cl. 422-64.000.
Goering, Kenneth J.; and Eslick, Robert F., to Endowment and Research Foundation at Montana State University. Production of products from waxy barley grain. 4,311,714, Cl. 426-28.000.
Goers, Walter E.: *See*—
Gerunda, Arthur B.; and Goers, Walter E., 4,311,677, Cl. 423-18.000.
Goessler, Gerhard, to E.G.O. Elektro-Gerate, Blanc und Fischer. Cooking apparatus. 4,311,899, Cl. 219-461.000.
Gold, Henning, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Test device for acceleration sensors. 4,311,035, Cl. 73-1.00D.
Goldin, Rodion G.; Tukhman, Vladimir Y.; and Yakimenko, Valentin G. Excitation system for a synchronous machine. 4,311,950, Cl. 318-718.000.
Goldowsky, Michael P., to U.S. Philips Corporation. Rigid-vane artifical heart. 4,310,930, Cl. 3-1.700.
Goldstein, Albert S., Jr.: *See*—
Clark, Wallace; and Goldstein, Albert S., Jr., 4,311,443, Cl. 418-48.000.
Golser, Leopold; and Woisetschlager, Helmut, to Chemie Linz Aktiengesellschaft. Process and apparatus for the continuous production of

foamed plastics material having improved fire resistance. 4,311,802, Cl. 521-133.000.

Goodacre, Ronald; and Piper, Ronald W., to Lansing Bagnall Limited. Industrial trucks and battery covers for them. 4,311,205, Cl. 180-68.500.

Goodman, James R.: *See—*
Upton, Hubert W.; and Goodman, James R., 4,311,999, Cl. 340-755.000.

Goodyear Tire & Rubber Company, The: *See—*
Chung, Daniel A., 4,311,765, Cl. 428-425.800.
Cottman, Kirkwood S., 4,311,637, Cl. 260-45.85B.
Frech, Kenneth J.; and Tazuma, James J., 4,311,680, Cl. 423-230.000.

Gordon, Alan M.: *See—*
Balzer, Gerry C.; Gordon, Alan M.; Leibowitz, Michael W.; and Wittig, Karl R., 4,311,880, Cl. 179-99.00H.

Goss, Gary J.; and Miller, Robert C., to Honeywell Information Systems Inc. Parallel generation of serial cyclic redundancy check. 4,312,068, Cl. 371-37.000.

Gotchel, Joel P.; and Neuenschwander, Rudolf, to Scott Paper Company. Web permeability tester. 4,311,037, Cl. 73-38.000.

Goto, Shigeo: *See—*
Yasui, Tadashi; Nakamura, Isamu; and Goto, Shigeo, 4,311,505, Cl. 65-43.000.

Goto, Teruo: *See—*
Nishizawa, Yoshihiko; Furukawa, Toshio; Goto, Teruo; and Onishi, Hirotsugu, 4,311,621, Cl. 260-17.200.

Gottsche, Marcus J.: *See—*
Smith, Arthur W.; and Gottsche, Marcus J., 4,311,125, Cl. 123-364.000.

Gould Inc.: *See—*
Berdan, Betty L.; and Luce, Betty M., 4,311,768, Cl. 428-626.000.

Goulianos, Konstantin; Smith, Karen K.; and White, Sebastian N., to Rockefeller University, The. Simple electronic apparatus for the analysis of radioactively labeled gel electrophoretograms. 4,311,908, Cl. 250-374.000.

Goy, Ronald S.: *See—*
Biggs, Ian; Goy, Ronald S.; and Whitehead, Kenneth E., 4,311,547, Cl. 156-244.130.

Gozzo, Franco; Abbruzzese, Luigi; and Siddi, Giorgio, to Montedison S.p.A. Method of combatting plants which infest maize cultivations without damaging the maize. 4,311,516, Cl. 71-111.000.

Grabmaier, Josef: *See—*
Hacker, Heinz; Aulich, Hubert; Grabmaier, Josef; and Douklias, Nikolaos, 4,311,726, Cl. 427-54.100.

Graefe, Gernot. Method for producing high-grade fertilizer. 4,311,510, Cl. 71-9.000.

Graefe, Gernot. Method for producing high-grade fertilizer. 4,311,511, Cl. 71-9.000.

Graham, Scott M.: *See—*
Utting, George R.; and Graham, Scott M., 4,311,909, Cl. 250-374.000.

Granberry, Walter E., Jr.: *See—*
Hubbard, Charlie J., Jr.; and Granberry, Walter E., Jr., 4,311,047, Cl. 73-204.000.

Grand, Michel; and Duprez, Daniel, to Elf Union. Catalysts for water dealkylation of aromatic hydrocarbons. 4,311,614, Cl. 252-466.0PT.

Grass Valley Group, Inc., The: *See—*
Dayton, Birney D., 4,311,921, Cl. 307-261.000.

Graul, Otto, to Messwandler-Bau GmbH. Layered transformer winding. 4,311,979, Cl. 336-205.000.

Green, Martin L.: *See—*
Chin, Gilbert Y.; Green, Martin L.; Sherwood, Richard C.; and Wernick, Jack H., 4,311,537, Cl. 148-108.000.

Greene, Jerrold W.: *See—*
Frederick, Louis J.; Hoke, Kenneth E.; Greene, Jerrold W.; and Miller, Stephen D., 4,311,430, Cl. 414-786.000.

Greene Line Mfg. Corp.: *See—*
Frederick, Louis J.; Hoke, Kenneth E.; Greene, Jerrold W.; and Miller, Stephen D., 4,311,430, Cl. 414-786.000.

Greene, Neil E.: *See—*
Eisenberg, Arnold J.; Greene, Neil E.; and Glaser, Hellmut I., 4,311,499, Cl. 65-1.000.

Greene, Richard E. Apparatus for controlling electrical power in a data processing system. 4,312,035, Cl. 364-200.000.

Greenwald Electro-Mechanical Consultants, Inc.: *See—*
Greenwald, Harry, 4,311,894, Cl. 200-340.000.

Greenwald, Harry, to Greenwald Electro-Mechanical Consultants, Inc. Switch button construction. 4,311,894, Cl. 200-340.000.

Gregorius, Klaus: *See—*
Janner, Karl; Gregorius, Klaus; Niemann, Hans-Joachim; Kersting, Arno; and Schuster, Eberhard, 4,311,674, Cl. 423-3.000.

Greier, Josef: *See—*
Freyn, Fritz; and Greier, Josef, 4,311,120, Cl. 123-192.00B.

Gretag Aktiengesellschaft: *See—*
Huber, Josef A., 4,311,914, Cl. 250-556.000.

Grieco, Frank G.; and Lovero, Vito R., to Grieco, Frank G. Apparatus for dispensing food stuffs from a sanitized container while maintaining the sanitary integrity thereof. 4,311,257, Cl. 222-387.000.

Grier, Nathaniel: *See—*
Dybas, Richard A.; Grier, Nathaniel; and Witzel, Bruce E., 4,311,709, Cl. 424-330.000.

Griesshammer, Rudolf: *See—*
Bugl, Erwin; Griesshammer, Rudolf; Lorenz, Helmut; Hamster, Helmut; and Koppl, Franz, 4,311,545, Cl. 156-613.000.

Griffith-Hope Company: *See—*
Hope, Samuel N., Jr.; and Filipowicz, Edwin A., 4,311,252, Cl. 221-57.000.

Grodinsky, Robert. Preamplifier for phonograph pickup. 4,312,060, Cl. 369-134.000.

Groenert, George J.: *See—*
Hendricks, Thomas E.; and Groenert, George J., 4,311,420, Cl. 410-121.000.

Grolleau, Claude: *See—*
Benoit, Michel; Gerlach, Pierre; Grolleau, Claude; and Lartillot, Alain, 4,311,975, Cl. 333-207.000.

Gross, Leo; and Skeist, S. Merrill, to Spellman High Voltage Electronics Corp. Fluorescent lamp with arc spreading with recombination structures. 4,311,943, Cl. 315-70.000.

Gross, Leo: *See—*
Skeist, S. Merrill; and Gross, Leo, 4,311,942, Cl. 315-62.000.

Grove, William S., to PPG Industries, Inc. Substituted diphenyl ethers having herbicidal activity. 4,311,515, Cl. 71-108.000.

Grumman Aerospace Corporation: *See—*
Rose, George R., Jr., 4,311,165, Cl. 137-355.12C.

GTE Automatic Electric Laboratories, Inc.: *See—*
Lim, Linda W., 4,311,267, Cl. 228-180.00A.
Zellmer, Neale A., 4,312,029, Cl. 363-21.000.

GTE Automatic Electric Labs Inc.: *See—*
Brush, Douglas J., 4,311,879, Cl. 179-18.0AH.
Danner, Dean W., 4,311,875, Cl. 179-2.00A.

GTE Laboratories Incorporated: *See—*
Patel, Lalit; and Cooperman, Michael, 4,311,926, Cl. 307-466.000.

GTE Products Corporation: *See—*
Fohl, Timothy, 4,311,453, Cl. 431-362.000.
Kirby, Thomas J., 4,312,032, Cl. 363-97.000.
Walker, Richard P., 4,311,069, Cl. 81-3.00J.

Guichard, Serge: *See—*
Frappart, Pierre; Guichard, Serge; and Saint Marcoux, Roland, 4,312,023, Cl. 361-243.000.

Guilbeau, Edgar A., to Regal International, Inc. Offshore bumper system and method of manufacturing. 4,311,412, Cl. 405-212.000.

Guillon, Marcel, to Societe Anonyme D.B.A. Absolute-control numerical hydraulic actuating device. 4,311,083, Cl. 91-19.000.

Gulf Research & Development Company: *See—*
Pellegrini, John P., Jr.; Austin, Richard G.; and Beach, David L., 4,311,613, Cl. 252-429.00R.
Pellegrini, John P., Jr.; Beach, David L.; and Kobylinski, Thaddeus P., 4,311,864, Cl. 585-530.000.

Gullo, Vincent P.: *See—*
Hernandez, Sebastian; Zimmerman, Sheldon B.; Gullo, Vincent P.; and Dewey, Ray S., 4,311,693, Cl. 424-122.000.

Gumprecht, William H., to Du Pont de Nemours, E. I., and Company. Process for the manufacture of 1,1,1,2-tetrafluoroethane. 4,311,863, Cl. 570-170.000.

Gunter, Thomas G.; Hobbs, Colleen M. E.; Spak, Michael E.; and Tredennick, Harry L., to Motorola, Inc. ALU and Condition code control unit for data processor. 4,312,034, Cl. 364-200.000.

Gunther, Dieter: *See—*
Glockler, Otto; Gunther, Dieter; Steinbrenner, Ulrich; Schulzke, Peter; and Sieber, Albrecht, 4,311,123, Cl. 123-325.000.

Gutierrez Atencio, Francisco J. Self commanded hydrostation. 4,311,410, Cl. 405-78.000.

Gutnick, David L.; Rosenberg, Eugene; Belsky, Igal; and Zinaida, Zosim, to Petroleum Fermentations N.V. Apo-β-emulsans. 4,311,829, Cl. 536-18.000.

Gutnick, David L.; Rosenberg, Eugene; Belsky, Igal; and Zosim, Zinaida, to Petroleum Fermentations N.V. Apo-α-emulsans. 4,311,830, Cl. 536-53.000.

Gutnick, David L.; Rosenberg, Eugene; Belsky, Igal; and Zinaida, Zosim, to Petroleum Fermentations N.V. Apo-ψ-emulsans. 4,311,831, Cl. 536-53.000.

Gutnick, David L.; Rosenberg, Eugene; Belsky, Igal; and Zinaida, Zosim, to Petroleum Fermentations N.V. Proemulsans. 4,311,832, Cl. 536-53.000.

Guyer, Robert R.: *See—*
Nettesheim, Daniel R.; and Guyer, Robert R., 4,311,381, Cl. 355-100.000.

Guyot, Patrick: *See—*
Sigwalt, Pierre; Guyot, Patrick; and Fontanille, Michel, 4,311,818, Cl. 326-173.000.

Guzeev, Evgeny A.: *See—*
Pimenov, Anatoly N.; Putlyaev, Ivan E.; Otrepiev, Vladimir A.; Guzeev, Evgeny A.; Shesterkina, Natalya F.; Paturoev, Vasily V.; and Pankovsky, Dmitry A., 4,311,530, Cl. 106-84.000.

Gysegem, A. Peter, to Ameron, Inc. Method for making antifouling coating composition containing hydrolyzed organotin siloxane polymer. 4,311,629, Cl. 260-33.6SB.

Hacker, Heinz; Aulich, Hubert; Grabmaier, Josef; and Douklias, Nikolaos, to Siemens Aktiengesellschaft. Method for the manufacture of a high-tensile strength optical waveguide. 4,311,726, Cl. 427-54.100.

Hada, Takeshi: *See—*
Akesaka, Toshio; and Hada, Takeshi, 4,311,411, Cl. 405-184.000.

Haerry, Willy R.: *See—*
Johner, Wilfried; Haerry, Willy R.; and Heman, Paul A., 4,311,882, Cl. 179-175.20D.

Hagawa, Takanori: *See—*
Takagi, Masatomo; Hagawa, Takanori; Takamatsu, Seietsu; and Ookoshi, Isao, 4,311,887, Cl. 200-42.00T.

Hagenmuller, Paul: *See*—
Demazeau, Gerard; Maestro, Patrick; Plante, Theophile; Pouchard, Michel; and Hagenmuller, Paul, 4,311,770, Cl. 428-694.000.
Hagihara, Bunji. Oxygen measuring electrode assembly. 4,311,151, Cl. 128-635.000.
Hagiwara, Hirotoshi: *See*—
Hiraoka, Hideo; Amemiya, Masaru; and Hagiwara, Hirotoshi, 4,311,941, Cl. 313-336.000.
Hahn, Klaus; Himmele, Walter; Naarmann, Herbert; and Penzien, Klaus, to BASF Aktiengesellschaft. Flame-retardant thermoplastic materials and molded parts therefrom. 4,311,636, Cl. 260-45.80N.
Hale Fire Pump Company: *See*—
Eberhardt, H. Alfred, 4,311,440, Cl. 417-360.000.
Hall, James A.; and Kent, Raymond C., to Armstrong World Industries. Process and apparatus for forming compressed crimped metal foil heater ribbon. 4,311,034, Cl. 72-318.000.
Hall, John M. Foldable ice pack. 4,311,022, Cl. 62-457.000.
Hall, John M., to Rolls-Royce Limited. Variable area nozzle for a gas turbine engine. 4,311,276, Cl. 239-265.390.
Hall, Robert J., to Norlin Industries, Inc. Electronic musical instrument chord correction techniques. 4,311,077, Cl. 84-1.030.
Halleck, Frank E. Sterilization indicator. 4,311,793, Cl. 435-31.000.
Halliburton Company: *See*—
Baldridge, Morris G., 4,311,414, Cl. 405-227.000.
Cox, Bruce M.; and Ho, Morris D., 4,311,054, Cl. 73-861.380.
Douthitt, John L.; and Davis, Gail F., 4,311,395, Cl. 366-27.000.
Halliburton Services: *See*—
Hushbeck, Donald F., 4,311,197, Cl. 166-373.000.
Hamacher, Martin. Shockproof fluorescent light fixture. 4,312,028, Cl. 362-369.000.
Hamada, Hideo; and Suga, Masaaki, to Nissan Motor Company, Ltd. Countershaft gear transmission. 4,311,062, Cl. 74-333.000.
Hamada, Hiroshi: *See*—
Uede, Hisashi; Inami, Yasuhiko; Hamada, Hiroshi; Hishida, Tadanori; and Nakauchi, Hiroshi, 4,312,000, Cl. 340-785.000.
Hamada, Kunio: *See*—
Iwamoto, Taro; Ando, Shimon; Kusumoto, Sho; Omae, Tsutomu; Suzuki, Toshitaka; Takidera, Masatake; Koyama, Takaichi; Hamada, Kunio; and Yoshida, Kazuhiro, 4,311,556, Cl. 376-249.000.
Hamada, Shinji; and Imai, Masaru, to Fuji Photo Film Co., Ltd. Presensitized plate handling device. 4,311,304, Cl. 271-13.000.
Hamada, Tsutomu: *See*—
Matsumura, Kenichi; Mizuguchi, Shinichi; Onoda, Tadayuki; Hamada, Tsutomu; and Noda, Hisato, 4,311,110, Cl. 118-50.100.
Hamster, Helmut: *See*—
Bugl, Erwin; Griesshammer, Rudolf; Lorenz, Helmut; Hamster, Helmut; and Koppl, Franz, 4,311,545, Cl. 156-613.000.
Hankins, Frederick E.: *See*—
Bibbo, Peter P.; Hankins, Frederick E.; and Jakoplic, Richard, 4,311,491, Cl. 55-2.000.
Hanna Furnace Corporation, The: *See*—
Bhattacharyya, Aniruddha, 4,311,597, Cl. 210-731.000.
Hanna, Gary D. Panel assemblies and components. 4,310,995, Cl. 52-806.000.
Hanneman, Franz, to Durkoppwerke GmbH. Sewing machine with upper and lower workpiece transporters. 4,311,106, Cl. 112-313.000.
Hannoschock, Kurt: *See*—
Ries, Karl; Hannoschock, Kurt; Rozic, Krsto-Marijan; Basler, Gunter; Sperl, Harald; and Weinschenk, Kurt, 4,311,905, Cl. 250-321.000.
Hanot, Pierre X.: *See*—
Duchateau, Georges F. M.; Pinet, Charles H. J.; and Hanot, Pierre X., 4,311,673, Cl. 422-272.000.
Hansford, Rowland C.: *See*—
Hass, Robert H.; and Hansford, Rowland C., 4,311,683, Cl. 423-573.00G.
Harada, Shinichi, to Kabushiki Kaisha Medos Kenkyusho. Electrical surgical knife device. 4,311,144, Cl. 128-303.150.
Haraguchi, Keisuke, to Asahi Kogaku Kogyo Kabushiki Kaisha. Mirror operating mechanism for single-lens reflex camera. 4,311,376, Cl. 354-153.000.
Haraikawa, Tetsuo; and Tamura, Koichi, to Tokico Ltd. Disc brake. 4,311,214, Cl. 188-1.110.
Harato, Takuo: *See*—
Yamada, Koichi; Harato, Takuo; Kato, Hisakatsu; and Shiozaki, Yasumi, 4,311,486, Cl. 23-301.000.
Harding, Gary, to Universal Foam Systems, Inc. Foam dispensing gun. 4,311,254, Cl. 222-145.000.
Hardman, Bruce B.; and Dujack, George M., to General Electric Company. Self-bonding silicone rubber compositions. 4,311,739, Cl. 427-387.000.
Harper, Jon J.; and Pietsch, Stephen J., to Standard Oil Company (Indiana). Membrane separation of catalyst metals from trimellitic acid production and separation of cobalt from manganese. 4,311,521, Cl. 75-101.0BE.
Harris Corporation: *See*—
Taylor, David L., 4,311,532, Cl. 148-1.500.
Taylor, David L., 4,312,046, Cl. 365-104.000.
Hartsell, Larry L. Rotary device. 4,311,121, Cl. 123-228.000.
Haruyama, Toshio: *See*—
Nitta, Issei; Haruyama, Toshio; and Inoue, Shinya, 4,311,646, Cl. 260-397.400.
Harvey, Jerry J. Washer-dryer for paint rollers. 4,311,158, Cl. 134-138.000.
Harvey, Richard P.: *See*—
Clark, Alan D.; Harvey, Richard P.; and Leming, Colin A., 4,311,366, Cl. 350-445.000.
Hasegawa, Tsunao, to Pioneer Electronic Corporation. Frequency response adjusting device for magnetic sound recorder. 4,312,020, Cl. 360-65.000.
Hashimoto, Masashi: *See*—
Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Imanaka, Hiroshi; Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; and Hashimoto, Masashi, 4,311,640, Cl. 260-112.50R.
Hashimoto, Michiaki: *See*—
Kaneko, Tadao; Hashimoto, Michiaki; Nakano, Toshio; and Sasano, Akira, 4,311,773, Cl. 430-7.000.
Haskell, Theodore H.; Mich, Thomas F.; Schweiss, Dietrich; and Culbertson, Townley P. Aminoacid derivatives of cephalosporin compounds. 4,311,698, Cl. 424-246.000.
Haskell, Theodore H.; Mich, Thomas F.; Sanchez, Joseph P.; and Schweiss, Dietrich. Aminoacid derivatives of cephalosporin compounds. 4,311,699, Cl. 424-246.000.
Haslanger, Martin F.: *See*—
Moniot, Jerome L.; Fox, Rita T.; Sprague, Peter W.; and Haslanger, Martin F., 4,311,644, Cl. 260-346.220.
Hass, Robert H.; and Hansford, Rowland C., to Union Oil Company of California. Process for removal of hydrogen sulfide from gas streams. 4,311,683, Cl. 423-573.00G.
Hastings, Larry W., to Tarco Incorporated. Apparatus for extracting bitumen from tar sand. 4,311,561, Cl. 196-14.520.
Hatcher, Ian: *See*—
Reed, Kingstone L. H.; Danchuk, William; and Hatcher, Ian, 4,311,017, Cl. 62-3.000.
Hausch, Walter R., to Firestone Tire & Rubber Company, The. Ambient temperature application of indicia to elastomer substrates. 4,311,181, Cl. 152-353.00R.
Hausler, Eberhard, to Richard Wolf GmbH. Apparatus for contact-free disintegration of kidney stones or other calculi. 4,311,147, Cl. 128-328.000.
Hawkins, Roger W.: *See*—
Stoves, Derek; Hawkins, Roger W.; and Smelt, Arthur B., 4,311,167, Cl. 137-454.200.
Hawley, Harry R., to Illinois Tool Works Inc. Swivel connector. 4,311,405, Cl. 403-142.000.
Hawley, Ronald E. Flute or piccolo stand. 4,311,294, Cl. 248-165.000.
Hayakawa, Masatoshi; and Ogi, Koei, to CKD Corporation. Basing heating apparatus. 4,311,457, Cl. 432-222.000.
Hayakawa, Masatoshi: *See*—
Uedaira, Satoru; Ito, Shigeyasu; Aso, Koichi; and Hayakawa, Masatoshi, 4,311,539, Cl. 148-121.000.
Hayakawa, Toshio; and Yoshida, Shoji, to Bridgestone Tire Company Limited. Motocross tire for motorcycles. 4,311,179, Cl. 152-209.00R.
Hayashi, Hideaki, to Nippon Columbia Kabushikikaisha. Record player. 4,312,061, Cl. 369-216.000.
Hayashi, Hiroo: *See*—
Oeda, Yoshitaka; Murakami, Takeshi; Hayashi, Hiroo; and Nakamura, Teruo, 4,311,758, Cl. 428-341.000.
Hayashi, Kazuo: *See*—
Beach, Daryl R.; and Hayashi, Kazuo, 4,311,467, Cl. 434-264.000.
Hayashi, Tatsuki: *See*—
Murano, Kazuo; Unagami, Shigeyuki; Itoh, Yoshikazu; Amano, Fumio; and Hayashi, Tatsuki, 4,312,075, Cl. 375-106.000.
Hayes, Donald R.: *See*—
Ortloff, John E.; Stelzer, Clarence F., Jr.; and Hayes, Donald R., 4,311,327, Cl. 285-136.000.
Hayes, John C. Food carrying and display container system. 4,311,237, Cl. 206-503.000.
Hazeltine Corporation: *See*—
Jones, William E., 4,311,965, Cl. 330-124.00R.
LaRosa, Richard, 4,311,971, Cl. 332-9.00R.
Heath, Robert B., to Rainsfords Metal Products Pty. Ltd. Infant carrier. 4,311,339, Cl. 297-487.000.
Heidelberger Druckmaschinen AG: *See*—
Jeschke, Willi, 4,311,095, Cl. 101-426.000.
Heine, Heinrich, to Bayer Aktiengesellschaft. Process for the production of moldings based on polyurethanes. 4,311,815, Cl. 525-504.000.
Heine, Olaf: *See*—
Diedrich, Bernd; Bohm, Ludwig; and Heine, Olaf, 4,311,752, Cl. 428-220.000.
Heinicke, Joachim H.: *See*—
Stewart, Daniel R.; and Heinicke, Joachim H., 4,311,201, Cl. 175-44.000.
Heman, Paul A.: *See*—
Johner, Wilfried; Haerry, Willy R.; and Heman, Paul A., 4,311,882, Cl. 179-175.20D.
Hemmi, Keiji: *See*—
Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Imanaka, Hiroshi; Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; and Hashimoto, Masashi, 4,311,640, Cl. 260-112.50R.
Hencey, Thomas R., Jr.; and Murphy, William J., to Hencey, Thomas R., Jr. Non-pollution motor. 4,311,917, Cl. 290-1.00A.
Hendricks, Thomas E.; and Groenert, George J., to Wilson Foods Corporation. Snubbing block cargo stabilization system for refrigerated carriers. 4,311,420, Cl. 410-121.000.

Hendriks, Ferdinand, to International Business Machines Corporation. Fluid pressure and velocity sensing apparatus. 4,311,436, Cl. 417-2.000.
Henley, Roger; and Reynolds, Blake W., to C & K Components, Inc. Miniature sealed dual-in-line switch. 4,311,884, Cl. 200-5.00R.
Hennessy, Arnold; and Inch, John D. Water-conserving toilet. 4,310,934, Cl. 4-321.000.
Herbst, Walter; and Pascal, Robert A. Combination storm and screen self storing door. 4,311,183, Cl. 160-37.000.
Herchenbach, Horst; and Ramesohl, Hubert, to Klockner-Humboldt-Deutz AG. Installation for calcining finely divided particles. 4,311,459, Cl. 432-247.000.
Hercules Incorporated: *See*—
Maslanka, William W.; and Spence, Gavin G., 4,311,809, Cl. 525-286.000.
Herczog, Andrew, to Corning Glass Works. Sealing glasses for electrochemical, electrical, electronic and optical applications. 4,311,772, Cl. 429-193.000.
Hermann Wangner GmbH & Co. KG: *See*—
Eckstein, Konrad, 4,311,172, Cl. 139-383.00A.
Hernandez, Sebastian; Zimmerman, Sheldon B.; Gullo, Vincent P.; and Dewey, Ray S., to Merck & Co., Inc. Discovery of MSD A63A, a new efrotomycin-line antibiotic fermentation broth. 4,311,693, Cl. 424-122.000.
Herolz, Robert A.: *See*—
Vogel, Charles B.; and Herolz, Robert A., 4,312,052, Cl. 367-75.000.
Herr, Alfons K., to KATAFLOX Patentverwaltungsgesellschaft mbH. Incombustible material. 4,311,554, Cl. 162-159.000.
Hertl, William; and Odstrchel, Gerald, to Corning Glass Works. Radiometric assay of dialysates. 4,311,687, Cl. 424-1.000.
Heuck, Claus-Christian. Process for the quantitative determination of a serum protein in turoid serum and plasma samples. 4,311,788, Cl. 435-7.000.
Hewitt, Sidney J.; Ozamiz, Juan M.; and Yallup, Albert E., to British-American Tobacco Company Limited. Measurement of moisture content. 4,311,957, Cl. 324-58.50R.
Hewlett-Packard Company: *See*—
Winfield, Augustus W., 4,312,007, Cl. 346-140.00R.
Heyer, Gunther; Kany, Karl; Spichala, Paul; Wossner, Felix; and Wecker, Wilhelm, to Fichtel & Sachs AG. Shock absorber device. 4,311,302, Cl. 267-64.230.
Hibino, Masahiro: *See*—
Kakizaki, Tadao; Utsugi, Akira; Hibino, Masahiro; and Otsubo, Kizuku, 4,311,129, Cl. 123-588.000.
Hidaka, Toshio: *See*—
Ueno, Tamotsu; Takahashi, Takehiko; Takada, Kazuo; Hidaka, Toshio; and Takagawa, Makoto, 4,311,868, Cl. 585-747.000.
Hiersig, Heinz M.; and Steinberg, Hans, to Mannesmann Aktiengesellschaft. Marine propulsion system for two propellers. 4,311,472, Cl. 440-75.000.
Hiki, Toshio; and Sugano, Kazuo, to Hitachi Koki Company, Limited. Printing apparatus with inked ribbon lift restrainer. 4,311,401, Cl. 400-248.000.
Hill, Berlie R., to Burlington Industries, Inc. Ultrasonic bonding process. 4,311,540, Cl. 156-73.100.
Himmele, Walter: *See*—
Hahn, Klaus; Himmele, Walter; Naarmann, Herbert; and Penzien, Klaus, 4,311,636, Cl. 260-45.80N.
Hindin, Eugene; Cripe, Alan R.; and Cripe, Christopher A., to Bi-Modal Corporation. Automatic coupler to connect convertible rail-highway vehicles end to end. 4,311,244, Cl. 213-86.000.
Hirabayashi, Fumio. Hole-drilling, extruding and thread-forming sheet screw. 4,311,423, Cl. 411-387.000.
Hiraiwa, Takashi; and Fujita, Yuichi, to Nippondenso Co., Ltd. Flameproof flexible printed circuit board. 4,311,749, Cl. 428-209.000.
Hiraoka Giken Kogyo Co., Ltd.: *See*—
Hiraoka, Kunizo, 4,311,632, Cl. 264-40.500.
Hiraoka, Hideo; Amemiya, Masaru; and Hagiwara, Hirotoshi, to Denki Kagaku Kogyo Kabushiki Kaisha. Thermionic cathode supporting device. 4,311,941, Cl. 313-336.000.
Hiraoka, Kunizo, to Hiraoka Giken Kogyo Co., Ltd. Process for molding a concrete pipe. 4,311,632, Cl. 264-40.500.
Hirata, Hitoshi; and Nishioka, Akira, to Pioneer Electronic Corporation. Current-controlled type division circuit. 4,311,928, Cl. 307-498.000.
Hirose, Yasuo. Incineration system for sewage sludge. 4,311,103, Cl. 110-238.000.
Hirsch, Gerhard: *See*—
Nuding, Erich; and Hirsch, Gerhard, 4,311,973, Cl. 333-33.000.
Hishida, Tadanori: *See*—
Uede, Hisashi; Inami, Yasuhiko; Hamada, Hiroshi; Hishida, Tadanori; and Nakauchi, Hiroshi, 4,312,000, Cl. 340-785.000.
Hitachi Koki Company, Limited: *See*—
Hiki, Toshio; and Sugano, Kazuo, 4,311,401, Cl. 400-248.000.
Hitachi, Ltd.: *See*—
Fujioka, Kazumasa; and Nakayama, Wataru, 4,311,931, Cl. 310-55.000.
Horiuchi, Junichiro; and Yagi, Hideyuki, 4,310,965, Cl. 29-580.000.
Imai, Masumi; Takato, Masao; and Furuhashi, Toshio, 4,312,038, Cl. 364-431.120.
Itoh, Masahiko; Midorikawa, Heihatiro; and Minato, Akira, 4,311,024, Cl. 62-474.000.
Iwamoto, Taro; Ando, Shimon; Kusumoto, Sho; Omae, Tsutomu; Suzuki, Toshitaka; Takidera, Masatake; Koyama, Takaichi; Hamada, Kunio; and Yoshida, Kazuhiro, 4,311,556, Cl. 376-249.000.
Kanbayashi, Kazuo, 4,312,011, Cl. 357-46.000.
Kaneko, Tadao; Hashimoto, Michiaki; Nakano, Toshio; and Sasano, Akira, 4,311,773, Cl. 430-7.000.
Kuribayashi, Tetsuzo; and Tsunematsu, Hiroshi, 4,311,013, Cl. 60-646.000.
Matsuzaki, Harumi; Kuroda, Osamu; Okouchi, Isao; Izumi, Kenkichi; and Takahashi, Sankichi, 4,311,575, Cl. 204-180.00P.
Matumoto, Michiaki; and Mimori, Sadao, 4,311,451, Cl. 431-352.000.
Ozaki, Sozaburo; and Tonooka, Isao, 4,311,936, Cl. 310-242.000.
Toudo, Kenzi; Miyanaka, Motoshi; Saeki, Ikuo; and Nakaoka, Yosiaki, 4,311,576, Cl. 204-196.000.
Tsubaki, Toshio; Tokunaga, Takeshi; Yonekura, Seiji; Matsuoka, Shigeru; Miura, Makoto; and Yamauchi, Kozi, 4,311,225, Cl. 192-142.00R.
Yamada, Koichiro, 4,311,008, Cl. 60-602.000.
Hitachi Medical Corporation: *See*—
Takami, Katsumi; Ito, Yoshitoshi; Ishimatsu, Kenji; and Tanaka, Eiichi, 4,311,907, Cl. 250-368.000.
Hnatko, Karl J., to Taconite Engineering & Manufacturing Co. Bearing cartridge supports for roll screens and the like. 4,311,242, Cl. 209-668.000.
Ho, Morris D.: *See*—
Cox, Bruce M.; and Ho, Morris D., 4,311,054, Cl. 73-861.380.
Hobbs, Colleen M. E.: *See*—
Gunter, Thomas G.; Hobbs, Colleen M. E.; Spak, Michael E.; and Tredennick, Harry L., 4,312,034, Cl. 364-200.000.
Hoch, Samuel: *See*—
Bellettiere, Samuel J.; Hurley, Raymond; and Hoch, Samuel, 4,311,625, Cl. 260-22.00R.
Hochtemperatur-Reaktorbau GmbH: *See*—
Schwiers, Hans-Georg; and Schoening, Josef, 4,311,558, Cl. 376-296.000.
Hodson, Donald R.; and Massie, Norbert A., to Rockwell International Corporation. Laser beam power multiplication. 4,311,360, Cl. 350-174.000.
Hoechst Aktiengesellschaft: *See*—
Buhr, Gerhard; and Ruckert, Hans, 4,311,782, Cl. 430-270.000.
Diedrich, Bernd; Bohm, Ludwig; and Heine, Olaf, 4,311,752, Cl. 428-220.000.
Schickfluss, Rudolf, 4,311,836, Cl. 542-443.000.
Hoffman, Larry J.: *See*—
Seeney, Charles E.; Kraemer, John F.; and Hoffman, Larry J., 4,311,619, Cl. 260-7.000.
Hoffmann, Ernst; Schatz, Friedrich; and Unger, Artur, to Kabel-und Metallwerke Gutehoffnungshutte AG. Forming stranded stock. 4,311,002, Cl. 57-293.000.
Hoffmann-La Roche Inc.: *See*—
Rosenberger, Michael, 4,311,645, Cl. 260-348.610.
Hohl Machine & Conveyor Co., Inc.: *See*—
Milazzo, Carl J., 4,311,231, Cl. 198-781.000.
Hohn, Karl; Hohn, Olaf; and Hohn, Wolfgang. Arrangement for baking dry flat bread. 4,311,088, Cl. 99-470.000.
Hohn, Olaf: *See*—
Hohn, Karl; Hohn, Olaf; and Hohn, Wolfgang, 4,311,088, Cl. 99-470.000.
Hohn, Wolfgang: *See*—
Hohn, Karl; Hohn, Olaf; and Hohn, Wolfgang, 4,311,088, Cl. 99-470.000.
Hohulin, Samuel E.: *See*—
Schaefer, Harold W.; Thomas, Joyce K.; and Hohulin, Samuel E., 4,311,493, Cl. 55-369.000.
Hoke, Kenneth E.: *See*—
Frederick, Louis J.; Hoke, Kenneth E.; Greene, Jerrold W.; and Miller, Stephen D., 4,311,430, Cl. 414-786.000.
Holand, Bard, to SINTEF (Selskapet for industriell og teknisk forskning ved NTH). Acoustic beacons. 4,312,054, Cl. 367-134.000.
Hold, Peter; Notte, Angelo J.; and Rizzi, Marc A., to USM Corporation. Injection molding machine controls. 4,311,446, Cl. 425-144.000.
Holland, Leslie, to National Research Development Corporation. Control of deposition of thin films. 4,311,725, Cl. 427-10.000.
Hollister Incorporated: *See*—
Kay, Paul O., 4,311,740, Cl. 427-428.000.
Holt, William D.; and Robinson, John M., to Lucas Industries Limited. Testing of enclosed electromagnetic relays. 4,311,961, Cl. 324-418.000.
Honeywell Information Systems Inc.: *See*—
Goss, Gary J.; and Miller, Robert C., 4,312,068, Cl. 371-37.000.
Porter, Marion G.; and Norman, Robert W., Jr., 4,312,036, Cl. 364-200.000.
Hood, Henry A., to Wall Industries, Inc. Method and apparatus using air jets for manufacturing faired articles. 4,311,079, Cl. 87-6.000.
Hook, Jan-Erik: *See*—
Akerlund, Sven G.; and Hook, Jan-Erik, 4,311,553, Cl. 162-23.000.
Hooker Chemicals & Plastics Corp.: *See*—
Sherwood, Donald W.; and Riordan, Daniel T., 4,311,620, Cl. 260-9.000.
Hope, Samuel N., Jr.; and Filipowicz, Edwin A., to Griffith-Hope Company. Napkin dispenser. 4,311,252, Cl. 221-57.000.
Horii, Kazuo: *See*—
Yoshizawa, Kiyoshi; Nojiro, Kikuo; Itoh, Masamitsu; Kiuchi, Hiroshi; and Horii, Kazuo, 4,311,721, Cl. 426-623.000.

Horikawa, Hiroshi: *See*—
Watanabe, Masahiro; and Horikawa, Hiroshi, 4,311,963, Cl. 328-163.000.
Horiuchi, Junichiro; and Yagi, Hideyuki, to Hitachi, Ltd. Process for producing a dielectric insulator separated substrate. 4,310,965, Cl. 29-580.000.
Hornak, Leonard P.: *See*—
Kowalski, Edward F.; Swidwa, Kenneth J.; and Hornak, Leonard P., 4,311,557, Cl. 376-271.000.
Hornig, Hans W., to Blendax-Werke R. Schneider GmbH & Co. Soap bar and process for its manufacture. 4,311,604, Cl. 252-90.000.
Horton, Jerry L. Propelled water craft. 4,311,108, Cl. 114-61.000.
Hosoya, Katsumi; and Kadowaki, Shunichi, to Nissan Motor Company, Limited. Fuel control measuring apparatus for internal combustion engine. 4,311,042, Cl. 73-118.000.
Hotta, Mitsuhiko; and Watanabe, Minoru, to Kabushiki Kaisha Morita Seisakusho. Dental treatment chair system. 4,311,461, Cl. 433-33.000.
Hovstadius, Oscar G., to Alfa-Laval AB. Centrifuge. 4,311,270, Cl. 233-46.000.
Howard Wall Limited: *See*—
Lewis, John W. R.; and Esner, Mark E., 4,310,954, Cl. 24-230.00A.
Howell, Robert M., to Sperry Corporation. Agricultural grinder mixers. 4,311,282, Cl. 241-56.000.
Hoya Corporation: *See*—
Motomura, Reiji; Ohta, Hirofumi; Matsuura, Takashi; and Itaya, Kou, 4,311,364, Cl. 350-318.000.
Hoyss, Franz, to Palar (Curacao) N.V. Cooling for brushes of electric motors. 4,311,935, Cl. 310-227.000.
Hubbard, Charlie J., Jr.; and Granberry, Walter E., Jr. Fluid presence detector. 4,311,047, Cl. 73-204.000.
Huber, Josef A., to Gretag Aktiengesellschaft. Process for assessing the quality of a printed product. 4,311,914, Cl. 250-556.000.
Hubmann, Max: *See*—
Weikl, Andreas; and Hubmann, Max, 4,311,136, Cl. 128-214.400.
Hudgins, James L. Speed handle ratchet wrench. 4,311,072, Cl. 81-476.000.
Huggins, Dale K.: *See*—
Queneau, Paul B.; Beckstead, Leo W.; and Huggins, Dale K., 4,311,679, Cl. 423-55.000.
Huggins, Homer D.: *See*—
Verhaeghe, Robert C.; and Huggins, Homer D., 4,311,193, Cl. 165-149.000.
Hughes Aircraft Company: *See*—
Leo, Bruno S., 4,311,021, Cl. 62-402.000.
Hui-Lai, Chen. Assembling members. 4,311,243, Cl. 211-113.000.
Huiatt, Jerry L.: *See*—
Smith, Gregory E.; Huiatt, Jerry L.; and Shirts, Monte B., 4,311,584, Cl. 209-12.000.
Hultman, Bengt G.; and Berglund, Erik A., to Mo och Domsjo Aktiebolag. Apparatus for controlling the degree of causticization in the preparation of white liquor from the chemicals recovered from black liquor. 4,311,666, Cl. 422-62.000.
Hummel, Matt N., to Acra Electric Corporation. Heater band. 4,311,900, Cl. 219-535.000.
Humphrey, Marshall F.; Ramohalli, Kumar N. R.; and Dowler, Warren L., to California Institute of Technology. Gasifiable carbon-graphite fibers. 4,311,630, Cl. 260-38.000.
Hunkapiller, Michael W.: *See*—
Ganfield, David J.; Hunkapiller, Michael W.; Knight, Ernest, Jr.; and Korant, Bruce D., 4,311,639, Cl. 260-112.50R.
Hurd, Wallace A., Jr.; and Youngren, Fred R., to Raytheon Company. Rocket motor. 4,311,005, Cl. 60-253.000.
Hurley, Raymond: *See*—
Bellettiere, Samuel J.; Hurley, Raymond; and Hoch, Samuel, 4,311,625, Cl. 260-22.00R.
Hurmence, Howard H. Golf club carriers. 4,311,264, Cl. 224-257.000.
Hushbeck, Donald F., to Halliburton Services. Annulus pressure operated closure valve with improved reverse circulation valve. 4,311,197, Cl. 166-373.000.
Hutchings, David A., to Consolidated Foundries and Mfg. Corp. Process for curing foundry cores and molds. 4,311,627, Cl. 260-30.40R.
Hutchinson, Martin A.: *See*—
Coad, George L.; Shaw, R. Howard; and Hutchinson, Martin A., 4,311,427, Cl. 414-217.000.
Iguchi, Eiko: *See*—
Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Imanaka, Hiroshi; Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; and Hashimoto, Masashi, 4,311,640, Cl. 260-112.50R.
Iijima, Yoshio, to Daido Metal Company Ltd. Method of producing semicircular washers having a projection to prevent rotation. 4,310,939, Cl. 10-86.00B.
Ikeda, Akihiko: *See*—
Miyake, Tetsuya; Takeda, Kunihiko; and Ikeda, Akihiko, 4,311,799, Cl. 521-31.000.
Ikeda, Takeshi: *See*—
Miyazaki, Takane; and Ikeda, Takeshi, 4,311,682, Cl. 423-448.000.
Illinois Tool Works Inc.: *See*—
Hawley, Harry R., 4,311,405, Cl. 403-142.000.
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, to Shin-Etsu Chemical Co., Ltd. Method for modifying surface properties of shaped articles of polymeric materials with low temperature plasma. 4,311,828, Cl. 528-483.000.
Imai, Hiroto, to Mitsubishi Jukogyo Kabushiki Kaisha. Counter ejector. 4,311,475, Cl. 493-142.000.
Imai, Masaru: *See*—
Hamada, Shinji; and Imai, Masaru, 4,311,304, Cl. 271-13.000.
Imai, Masumi; Takato, Masao; and Furuhashi, Toshio, to Hitachi, Ltd. Electronic engine control apparatus having arrangement for detecting stopping of the engine. 4,312,038, Cl. 364-431.120.
Imai, Shozaburo; Suzuki, Haruo; Asai, Kuniaki; and Ueno, Katsuji, to Sumitomo Chemical Company Limited. Process for producing aromatic polyesters. 4,311,823, Cl. 528-181.000.
Imanaka, Hiroshi: *See*—
Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Imanaka, Hiroshi; Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; and Hashimoto, Masashi, 4,311,640, Cl. 260-112.50R.
Immunology Development Corporation, The: *See*—
Angers, John W.; and Korik, Lazar, 4,311,686, Cl. 424-1.000.
Imperial Chemical Industries Limited: *See*—
Barham, Peter J.; Odell, Jeffrey A.; and Willmouth, Frank M., 4,311,660, Cl. 264-342.0RE.
Cowen, Geoffrey; Norton-Berry, Philip; and Steel, Margaret L., 4,311,570, Cl. 204-157.10R.
Evans, John R.; Fildes, Francis J. T.; and Oliver, Jean E., 4,311,712, Cl. 424-365.000.
Notman, Alan, 4,311,671, Cl. 422-148.000.
Imre, Laszlo. Wind propelled apparatus. 4,311,107, Cl. 114-39.000.
Inaba, Toshimitsu, to Yoshida, Kogyo K. K. Apparatus for painting a multiplicity of parts together. 4,311,111, Cl. 118-56.000.
Inami, Yasuhiko: *See*—
Uede, Hisashi; Inami, Yasuhiko; Hamada, Hiroshi; Hishida, Tadanori; and Nakauchi, Hiroshi, 4,312,000, Cl. 340-785.000.
Inch, John D.: *See*—
Hennessy, Arnold; and Inch, John D., 4,310,934, Cl. 4-321.000.
Inmont Corporation: *See*—
Civardi, Frank P., 4,311,745, Cl. 428-91.000.
Innocenti Santeustacchio S.p.A.: *See*—
Nessi, Aurindo, 4,311,032, Cl. 72-208.000.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,311,733, Cl. 427-230.000.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Method of preparing a capillary heat-pipe wicking structure. 4,311,733, Cl. 427-230.000.
Inoue, Shigeru; Ono, Hiroshi; Fukui, Akito; and Morikawa, Haruyuki, to Toyo Engineering Corp.; and Mitsui Toatsu Chemicals, Inc. Process for synthesizing urea. 4,311,856, Cl. 564-67.000.
Inoue, Shinya: *See*—
Nitta, Issei; Haruyama, Toshio; and Inoue, Shinya, 4,311,646, Cl. 260-397.400.
Institut Francais du Petrole: *See*—
Rojey, Alexandre; and Cohen, Georges, 4,311,019, Cl. 62-101.000.
Intermedicat GmbH: *See*—
Weikl, Andreas; and Hubmann, Max, 4,311,136, Cl. 128-214.400.
International Business Machines Corporation: *See*—
Bantz, David F.; Evangelisti, Carlo J.; and Nelson, Robert A., 4,312,066, Cl. 371-16.000.
Chang, Albert Y.; and Pandya, Punit J., 4,311,925, Cl. 307-455.000.
Frieser, Rudolf G.; and Reeber, Morton D., 4,312,012, Cl. 357-82.000.
Hendriks, Ferdinand, 4,311,436, Cl. 417-2.000.
Loughridge, Mark, 4,311,400, Cl. 400-166.000.
International Coatings Co., Inc.: *See*—
Glennon, Alfred E., 4,311,759, Cl. 428-345.000.
International Flavors & Fragrances Inc.: *See*—
Marmo, Don; and Rocco, Frank L., 4,311,720, Cl. 426-594.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,311,602, Cl. 252-8.600.
Sprecker, Mark A., 4,311,861, Cl. 568-659.000.
Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,311,754, Cl. 428-284.000.
International Harvester Company: *See*—
Chatterjea, Probir K., 4,311,068, Cl. 74-733.000.
International Standard Electric Corporation: *See*—
Johner, Wilfried; Haerry, Willy R.; and Heman, Paul A., 4,311,882, Cl. 179-175.20D.
Interox Chemicals Limited: *See*—
Verachtert, Hubert, 4,311,598, Cl. 210-757.000.
INTERx Research Corporation: *See*—
Bodor, Nicholas S.; Sloan, Kenneth B.; and Pogany, Stefano A., 4,311,706, Cl. 424-301.000.
Irie, Yoshio: *See*—
Itakura, Gen; Kuramitsu, Hideki; Takada, Yamato; Kuroda, Takayuki; and Irie, Yoshio, 4,311,729, Cl. 427-80.000.
Irvin, Dee L.; and Strong, Walter C. Automatic tip up fishing device. 4,310,983, Cl. 43-17.000.
Irwin, Howard D., to Du Pont de Nemours, E. I., and Company. Railway car truck bolster. 4,311,098, Cl. 105-226.000.
Isaac, Benjamin O.: *See*—
Ansari, Hifzur R.; Isaac, Benjamin O.; and Wagner, Horst R., 4,311,617, Cl. 252-522.00R.
Isaka, Ichiro: *See*—
Koda, Akio; Isaka, Ichiro; and Murakami, Yukiyasu, 4,311,842, Cl. 544-27.000.
Isberg, Gary J.; Wickman, Klaus; and Reid, David, to Trail Manufacturing Limited. Brake control assembly. 4,310,972, Cl. 30-382.000.

Ise Electronics Corporation: *See*—
Nakamura, Tadashi; and Kiyozumi, Kentaro, 4,311,996, Cl. 340-711.000.
Ishikawa, Takatoshi, to Fuji Photo Film Co., Ltd. Regeneration of photographic processing solutions. 4,311,574, Cl. 204-180.00P.
Ishimatsu, Kenji: *See*—
Takami, Katsumi; Ito, Yoshitoshi; Ishimatsu, Kenji; and Tanaka, Eiichi, 4,311,907, Cl 250-368.000.
Ishizaka, Mitsuo; and Sumida, Heiji, to General Electric Company. Adhesive silicone compositions for substrates. 4,311,737, Cl. 427-386.000.
Ishizaki, Yoshihiro: *See*—
Fujii, Masaki; Miyabayashi, Mitsutaka; Todaka, Hironori; and Ishizaki, Yoshihiro, 4,311,810, Cl. 525-321.000.
Isobe, Yoichi: *See*—
Sauer, Hans; Kasano, Humihiro; and Isobe, Yoichi, 4,311,976, Cl. 335-78.000.
Itakura, Gen; Kuramitsu, Hideki; Takada, Yamato; Kuroda, Takayuki; and Irie, Yoshio, to Matsushita Electric Industrial Co., Inc. Method for manufacturing a ceramic electronic component by electroless metal plating. 4,311,729, Cl. 427-80.000.
Itaya, Kou: *See*—
Motomura, Reiji; Ohta, Hirofumi; Matsuura, Takashi; and Itaya, Kou, 4,311,364, Cl. 350-318.000.
Ito, Shigeyasu: *See*—
Uedaira, Satoru; Ito, Shigeyasu; Aso, Koichi; and Hayakawa, Masatoshi, 4,311,539, Cl. 148-121.000.
Ito, Yoshitoshi: *See*—
Takami, Katsumi; Ito, Yoshitoshi; Ishimatsu, Kenji; and Tanaka, Eiichi, 4,311,907, Cl. 250-368.000.
Itoga, Keiji: *See*—
Oka, Hideki; Itoga, Keiji; and Mochizuki, Tsutomu, 4,311,715, Cl. 426-46.000.
Itoh Iron & Steel Works Co. Ltd.: *See*—
Tabuchi, Seigo, 4,311,454, Cl. 432-11.000.
Itoh, Masahiko; Midorikawa, Heihatiro; and Minato, Akira, to Hitachi, Ltd. Hermetically circulating, absorption type refrigerator. 4,311,024, Cl. 62-474.000.
Itoh, Masamitsu: *See*—
Yoshizawa, Kiyoshi; Nojiro, Kikuo; Itoh, Masamitsu; Kiuchi, Hiroshi; and Horii, Kazuo, 4,311,721, Cl. 426-623.000.
Itoh, Yoshikazu: *See*—
Murano, Kazuo; Unagami, Shigeyuki; Itoh, Yoshikazu; Amano, Fumio; and Hayashi, Tatsuki, 4,312,075, Cl. 375-106.000.
ITT Industries, Inc.: *See*—
Schopper, Bernd, 4,311,345, Cl. 303-84.00A.
Iwami, Naoki: *See*—
Kadowaki, Hidejiro; Kurosaki, Yasuhide; Aoki, Takao; and Iwami, Naoki, 4,311,778, Cl. 430-54.000.
Iwamoto, Taro; Ando, Shimon; Kusumoto, Sho; Omae, Tsutomu; Suzuki, Toshitaka; Takidera, Masatake; Koyama, Takaichi; Hamada, Kunio; and Yoshida, Kazuhiro, to Hitachi, Ltd. Method and system for inspection of inside of nuclear reactor vessel. 4,311,556, Cl. 376-249.000.
Iwasaki, Kyuhachiro, to Ricoh Company, Ltd. Ink jet printing apparatus. 4,312,005, Cl. 346-75.000.
Iwaya, Shoichi; and Masujima, Sho, to TDK Electronics Co., Ltd. Chip ceramic capacitor. 4,312,026, Cl. 361-321.000.
Izumi, Kenkichi: *See*—
Matsuzaki, Harumi; Kuroda, Osamu; Okouchi, Isao; Izumi, Kenkichi; and Takahashi, Sankichi, 4,311,575, Cl. 204-180.00P.
J. H. Dallmeyer Limited: *See*—
Clark, Alan D.; Harvey, Richard P.; and Leming, Colin A., 4,311,366, Cl. 350-445.000.
J. M. Huber Corporation: *See*—
Wagner, Joseph E., III; and Williams, Lloyd E., 4,311,609, Cl. 252-179.000.
Jabs, Alfred: *See*—
Vedova, Ralph; and Jabs, Alfred, 4,311,313, Cl. 277-27.000.
Jackovitz, Frank J., to Midland-Ross Corporation. Screw retainer. 4,311,422, Cl. 411-112.000.
Jackson, Jacob J. Multi-purpose ladder attachment. 4,311,210, Cl. 182-214.000.
Jackson, William L., to Dunlop Limited. Pneumatic tire capable of being driven deflated. 4,311,180, Cl. 152-330.0RF.
Jacob, Eberhard; and Bacher, Walter, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft; and Kernforschungszentrum Karlsruhe GmbH. Method for removing uranium-containing deposits in uranium hexafluoride processing equipment. 4,311,678, Cl. 423-19.000.
Jacob, Ezekiel J. Poromeric sheet material with deporomerized areas. 4,311,734, Cl. 427-245.000.
Jacobs, Jose C. Language translator. 4,311,465, Cl. 434-157.000.
Jacobs, Trigg R. Game call. 4,310,986, Cl. 46-189.000.
Jaecker, John A.: *See*—
Johnson, Marvin F. L.; and Jaecker, John A., 4,311,582, Cl. 208-139.000.
Jager, Horst: *See*—
Bersier, Jacques; Jager, Horst; and Schwander, Hansrudolf, 4,311,565, Cl. 204-73.00R.
Jakoplic, Richard: *See*—
Bibbo, Peter P.; Hankins, Frederick E.; and Jakoplic, Richard, 4,311,491, Cl. 55-2.000.
Jamar, Walker, Jr. Article support having a locking article holder detachably mounted on a wall mount. 4,311,295, Cl. 248-221.300.
Janner, Karl; Gregorius, Klaus; Niemann, Hans-Joachim; Kersting, Arno; and Schuster, Eberhard, to Kraftwerk Union Aktiengesellschaft. Method of separating isotopes from gaseous mixtures. 4,311,674, Cl. 423-3.000.
Janssen, Robert A.: *See*—
Mayhan, Kenneth G.; Janssen, Robert A.; and Bertrand, William J., 4,311,573, Cl. 204-159.150.
Japan Atomic Energy Research Institute: *See*—
Kaetsu, Isao; Kumakura, Minoru; Yoshida, Masaru; Shimaoka, Goro; and Urabe, Masanobu, 4,311,732, Cl. 427-164.000.
Japan Electronic Control Systems Co. Ltd.: *See*—
Kakizaki, Tadao; Utsugi, Akira; Hibino, Masahiro; and Otsubo, Kizuku, 4,311,129, Cl. 123-588.000.
Japan Foundation for Artificial Organs: *See*—
Nose, Yukihiko; and Malchesky, Paul S., 4,311,587, Cl. 210-136.000.
Jarauch, Franz: *See*—
Geyer, Ludwig; and Jarauch, Franz, 4,311,336, Cl. 296-201.000.
Jean, Eltgen; and Alain, Jossic, to Compagnie Internationale Pour l'Informatique CII-Honeywell Bull. Recording control arrangement for a dot recording machine. 4,312,045, Cl. 364-900.000.
Jeffers, Michael F.: *See*—
Glaab, Joseph B.; and Jeffers, Michael F., 4,312,016, Cl. 358-188.000.
Jeffras, Nathaniel B.; and Modispacher, Donald R., to Automation Industries, Inc. Ultrasonic control contour follower. 4,311,052, Cl. 73-634.000.
Jenkins, Maurice A. Universal towed vehicle wind umbrella. 4,311,334, Cl. 296-1.00S.
Jenoptik Jena G.m.b.H.: *See*—
Kiel, Hans-Jurgen; and Kuhn, Gebhard, 4,311,468, Cl. 434-286.000.
Jerrold Electronics Corporation: *See*—
Glaab, Joseph B.; and Jeffers, Michael F., 4,312,016, Cl. 358-188.000.
Jeschke, Willi, to Heidelberger Druckmaschinen AG. Cleaning device for printing-unit cylinders in offset printing machines. 4,311,095, Cl. 101-426.000.
Jette, Emile. Water flow control device for a showerhead. 4,311,279, Cl. 239-562.000.
Jewelmasters, Inc.: *See*—
Ochoa, Enrique J., 4,311,026, Cl. 63-15.000.
Jezl, James L.: *See*—
Boone, David E.; and Jezl, James L., 4,311,612, Cl. 252-429.00B.
JH Industries, Inc.: *See*—
Johnson, Dwight N., 4,311,236, Cl. 206-488.000.
Jogbra Incorporated: *See*—
Schreiber, Hinda S.; Lindahl, Eugenie Z.; and Smith, Polly P., 4,311,150, Cl. 128-494.000.
Johner, Wilfried; Haerry, Willy R.; and Heman, Paul A., to International Standard Electric Corporation. Method of and arrangement for testing traffic routes in telecommunication networks. 4,311,882, Cl. 179-175.20D.
Johnson, Bruce K.; and Morse, John B., to Polaroid Corporation. Camera flash array and holder receptacle. 4,311,374, Cl. 354-144.000.
Johnson, Curtis D.; and Baker, Philip L., to United States of America, Army. General purpose automatic weapon system. 4,311,082, Cl. 89-191.00R.
Johnson, Dwight N., to JH Industries, Inc. Package product and method. 4,311,236, Cl. 206-488.000.
Johnson, Marvin F. L.; and Jaecker, John A., to Atlantic Richfield Company. Stabilized reforming catalyst. 4,311,582, Cl. 208-139.000.
Johnson, Rubein V. Hearing aid ear mold with improved discrimination. 4,311,206, Cl. 181-135.000.
Jones, Marvin C.: *See*—
Lees, Robert; and Jones, Marvin C., 4,311,114, Cl. 118-694.000.
Jones, William E., to Hazeltine Corporation. Modular amplifier with discrete power reduction switching. 4,311,965, Cl. 330-124.00R.
Jordan, Richard A., to Solar Suede Corporation. Method and apparatus for depositing flock fibers. 4,311,113, Cl. 118-629.000.
Joung, John J., to American Hospital Supply Corporation. Surgeon's glove and talc free process for forming same. 4,310,928, Cl. 2-161.00R.
Joyce, Arthur B.: *See*—
Eley, James M.; and Joyce, Arthur B., 4,311,445, Cl. 418-132.000.
Joyce, Michael F. Container with releasable closure. 4,311,249, Cl. 220-268.000.
Jubenville, Duncan B.; and DeGrazia, Melvin G., Jr., to Rock Oil Corporation. Sonic treating apparatus. 4,311,157, Cl. 134-125.000.
Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; and Mages, Bernhard, 4,310,948, Cl. 16-335.000.
Julke, Elias, to BBC, Brown, Boveri & Company, Limited. Flotation process for purification of waste water. 4,311,595, Cl. 210-671.000.
Jung, John A.; and Peress, Jimmy, to Chem Systems Inc. Preparation of carboxylic acid esters with BF_3-alcohol complex catalyst. 4,311,851, Cl. 560-233.000.
Junya, Seta, to Yugen Kaisha Parusu Giken. Heating apparatus for annular bearings and rings. 4,311,896, Cl. 219-10.570.
Kabel-und Metallwerke Gutehoffnungshutte AG: *See*—
Breitenbach, Otto, 4,310,966, Cl. 29-596.000.
Hoffmann, Ernst; Schatz, Friedrich; and Unger, Artur, 4,311,002, Cl. 57-293.000.
Kabushiki Kaisha Aoki Kensetsu: *See*—
Akesaka, Toshio; and Hada, Takeshi, 4,311,411, Cl. 405-184.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Mandai, Masaaki; Torisawa, Akira; Ueda, Makoto; Asano, Kazuhiro; Shida, Masaharu; and Satoh, Katsuhiko, 4,312,059, Cl. 368-157.000.

Shida, Masaharu; Torisawa, Akira; and Ueda, Makoto, 4,312,058, Cl. 368-66.000.
Ueda, Makoto; Torisawa, Akira; Otawa, Shuji; Mandai, Masaaki; Shida, Masaharu; and Sato, Katsuhiko, 4,311,947, Cl. 318-696.000.
Kabushiki Kaisha Iseki Kaihatsu Koki: *See*—
Akesaka, Toshio, 4,311,344, Cl. 299-33.000.
Akesaka, Toshio; and Hada, Takeshi, 4,311,411, Cl. 405-184.000.
Kabushiki Kaisha Medos Kenkyusho: *See*—
Harada, Shinichi, 4,311,144, Cl. 128-303.150.
Kabushiki Kaisha Morita Seisakusho: *See*—
Beach, Daryl R.; and Hayashi, Kazuo, 4,311,467, Cl. 434-264.000.
Hotta, Mitsuhiko; and Watanabe, Minoru, 4,311,461, Cl. 433-33.000.
Kabushiki Kaisha Sankyo Seisakujo: *See*—
Kato, Heizaburo; Ogawa, Yoshio; and Nishioka, Masao, 4,311,224, Cl. 192-56.00R.
Kabushiki Kaisha Senesu Shoko: *See*—
Aoyama, Tadamasa, 4,311,945, Cl. 318-561.000.
Kadowaki, Hidejiro; Kurosaki, Yasuhide; Aoki, Takao; and Iwami, Naoki, to Canon Kabushiki Kaisha. Electrophotographic method. 4,311,778, Cl. 430-54.000.
Kadowaki, Shunichi: *See*—
Hosoya, Katsumi; and Kadowaki, Shunichi, 4,311,042, Cl. 73-118.000.
Kaelber, Gunter, to BBC Brown Boveri & Company, Limited. Supporting device. 4,311,016, Cl. 60-687.000.
Kaeser, James A., to Colgate Palmolive Company. Method for manufacture of non-gelling, stable inorganic salt crutcher slurries. 4,311,606, Cl. 252-135.000.
Kaeser, James A., to Colgate Palmolive Company. Method for manufacture of non-gelling, stable zeolite - inorganic salt crutcher slurries. 4,311,607, Cl. 252-140.000.
Kaetsu, Isao; Kumakura, Minoru; Yoshida, Masaru; Shimaoka, Goro; and Urabe, Masanobu, to Mitsubishi Gas Chemical Company Inc.; and Japan Atomic Energy Research Institute. Primer composition and a process for producing a coated product using the same. 4,311,732, Cl. 427-164.000.
Kahn, Leonard R. Method and means for improving the reliability of systems that transmit relatively wideband signals over two or more relatively narrowband transmission circuits. 4,311,877, Cl. 179-15.55R.
Kaiser, Roman; and Lamparsky, Dietmar, to Givaudan Corporation. Flavoring with 2,4,4-trimethyl-3-(buta-1,3-dienyl)cyclohex-2-en-one. 4,311,718, Cl. 426-538.000.
Kajdas, Czeslaw; Nita, Jozef; and Krawczyk, Krzysztof, to Politechnika Swietokrzyska. Method and device for testing lubricating properties of lubricating means. 4,311,036, Cl. 73-10.000.
Kakizaki, Tadao; Utsugi, Akira; Hibino, Masahiro; and Otsubo, Kizuku, to Nissan Motor Co. Limited; and Japan Electronic Control Systems Co. Ltd. Auxiliary air regulator for internal combustion engine. 4,311,129, Cl. 123-588.000.
Kalinowski, Robert E.; and Lipowitz, Jonathan, to Dow Corning Corporation. Method for applying mercaptoalkyl-containing polydiorganosiloxanes to textile fibers. 4,311,760, Cl. 428-391.000.
Kallenberger, Robert H., to Phillips Petroleum Company. Method and apparatus for producing carbon black. 4,311,672, Cl. 422-150.000.
Kaminski, Mitchell V., Jr.: *See*—
Courtney, Barry G.; and Kaminski, Mitchell V., Jr., 4,311,148, Cl. 128-348.000.
Kaminsky, Didier: *See*—
Bert, Alain; Kaminsky, Didier; and Kantorowicz, Gerard, 4,311,966, Cl. 330-286.000.
Kampe, Marcis M.: *See*—
Borror, Alan L.; Cincotta, Louis; Foley, James W.; and Kampe, Marcis M., 4,311,839, Cl. 544-135.000.
Kanbara, Youichi; and Kurioka, Shunichiro, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Filament for wig. 4,311,761, Cl. 428-397.000.
Kanbayashi, Kazuo, to Hitachi, Ltd. Darlington power transistor. 4,312,011, Cl. 357-46.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Kanbara, Youichi; and Kurioka, Shunichiro, 4,311,761, Cl. 428-397.000.
Kaneko, Tadao; Hashimoto, Michiaki; Nakano, Toshio; and Sasano, Akira, to Hitachi, Ltd. Method of producing color filters. 4,311,773, Cl. 430-7.000.
Kang, Kenneth S.; and Veeder, George T., to Merck & Co., Inc. Polysaccharide S-53 and bacterial fermentation process for its preparation. 4,311,795, Cl. 435-101.000.
Kantorowicz, Gerard: *See*—
Bert, Alain; Kaminsky, Didier; and Kantorowicz, Gerard, 4,311,966, Cl. 330-286.000.
Kany, Karl: *See*—
Heyer, Gunther; Kany, Karl; Spichala, Paul; Wossner, Felix; and Wecker, Wilhelm, 4,311,302, Cl. 267-64.230.
Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Oeda, Yoshitaka; Murakami, Takeshi; Hayashi, Hiroo; and Nakamura, Teruo, 4,311,758, Cl. 428-341.000.
Kaplan, Fred A.: *See*—
Emmons, William D.; and Kaplan, Fred A., 4,311,624, Cl. 260-22.0CB.
Karl, Robert D.; Kentosh, James M.; and Vitale, John, to Amtel, Inc. Mooring terminal with top mounted fluid swivel. 4,310,937, Cl. 9-8.00P.
Kasano, Humihiro: *See*—
Sauer, Hans; Kasano, Humihiro; and Isobe, Yoichi, 4,311,976, Cl. 335-78.000.
Kashiwa, Norio: *See*—
Morita, Yoshinori; and Kashiwa, Norio, 4,311,817, Cl. 526-124.000.
Kashiwagi, Hideo: *See*—
Saito, Takeshi; Ueno, Takashi; and Kashiwagi, Hideo, 4,311,368, Cl. 351-165.000.
Kasper, Erich; and Weber, Suso, to Licentia Patent-Verwaltungs GmbH. Semiconductor-glass composite material and method for producing it. 4,311,743, Cl. 428-64.000.
Kast, Jack L.; and Young, Edgar J., to Remington Arms Company, Inc. Magazine spring retainer and cap detent system. 4,310,982, Cl. 42-75.00B.
KATAFLOX Patentverwaltungsgesellschaft mbH.: *See*—
Herr, Alfons K., 4,311,554, Cl. 162-159.000.
Katinger, Hermann; and Scheirer, Winfried, to Chemap AG. Method of and an arrangement for cultivating cells of animal and human tissues. 4,311,798, Cl. 435-286.000.
Kato Hatsujou Kabushiki Kaisha: *See*—
Okada, Shigeo; and Sato, Katsuo, 4,311,421, Cl. 411-59.000.
Kato, Heizaburo; Ogawa, Yoshio; and Nishioka, Masao, to Kabushiki Kaisha Sankyo Seisakujo. Torque limiter. 4,311,224, Cl. 192-56.00R.
Kato, Hisakatsu: *See*—
Yamada, Koichi; Harato, Takuo; Kato, Hisakatsu; and Shiozaki, Yasumi, 4,311,486, Cl. 23-301.000.
Kawada, Takaharu: *See*—
Okada, Masashi; Akiyama, Yuji; Kawada, Takaharu; and Kawahara, Atsushi, 4,311,904, Cl. 250-204.000.
Kawaguchi, Hiroshi; and Sanayama, Masaki, to Toyota Jidosha Kabushiki Kaisha. Parking brake operating device. 4,311,060, Cl. 74-142.000.
Kawahara, Atsushi: *See*—
Okada, Masashi; Akiyama, Yuji; Kawada, Takaharu; and Kawahara, Atsushi, 4,311,904, Cl. 250-204.000.
Kawasaki Steel Corporation: *See*—
Morito, Nobuyuki, 4,311,538, Cl. 148-112.000.
Kay, Paul O., to Hollister Incorporated. Indentification strip assembly and method of use thereof. 4,311,740, Cl. 427-428.000.
Keene, Wayne H., to Raytheon Company. Laser scanning system. 4,311,384, Cl. 356-152.000.
Keene, Wayne H., to Raytheon Company. Coherent detection lag angle compensated scanning system independent of inhomogeneities of the detector. 4,311,385, Cl. 356-152.000.
Keledjian, Gaston: *See*—
Balaud, Daniel; Keledjian, Gaston; and Passemard, Jean R., 4,310,958, Cl. 29-26.00A.
Kellar, John D.; and Pereman, Gordon F., to PPG Industries, Inc. Method of controlling temperature of glass exiting furnaces. 4,311,503, Cl. 65-29.000.
Keller, Gerhard, to Schaltbau Gesellschaft mbH. Connecting a light-conducting fiber, fiber bundle, or light pipe to a light-emitting or light-receiving element. 4,311,359, Cl. 350-96.200.
Kelley, Stephen H.; and Ulmer, Richard W., to Motorola Inc. Programmable A-law and μ-law DAC. 4,311,988, Cl. 340-347.0DA.
Kelly, Peter B., to General Electric Company. Process for repairing a damaged section of a bowling lane. 4,311,177, Cl. 144-310.00R.
Ken, Victor: *See*—
Schapira, Joseph; Ken, Victor; Masson, Jean C.; and Duboys, Francois J., 4,311,536, Cl. 148-6.15R.
Kendall Company, The: *See*—
Leong, Koon-Wah, 4,311,736, Cl. 427-331.000.
Kennedy, Arthur E., to National Gypsum Company. Gypsum wallboard and method for producing same. 4,311,767, Cl. 428-537.000.
Kennedy, John P.: *See*—
Marsalka, Joseph P.; and Kennedy, John P., 4,311,363, Cl. 350-299.000.
Kennedy, Robert A. Interior space divider for golf bag. 4,311,178, Cl. 150-1.50R.
Kent, Raymond C.: *See*—
Hall, James A.; and Kent, Raymond C., 4,311,034, Cl. 72-318.000.
Kentosh, James M.: *See*—
Karl, Robert D.; Kentosh, James M.; and Vitale, John, 4,310,937, Cl. 9-8.00P.
Kernforschungsanlage Julich GmbH: *See*—
Klatt, Karl-Heinz; and Wenzl, Helmut, 4,311,232, Cl. 206-0.700.
Kernforschungszentrum Karlsruhe GmbH: *See*—
Jacob, Eberhard; and Bacher, Walter, 4,311,678, Cl. 423-19.000.
Kersting, Arno: *See*—
Janner, Karl; Gregorius, Klaus; Niemann, Hans-Joachim; Kersting, Arno; and Schuster, Eberhard, 4,311,674, Cl. 423-3.000.
Kerttula, Into, to Bison-Werke Bahre & Greten GmbH & Co. KG. Continuously operating board press. 4,311,550, Cl. 156-555.000.
Khachatourians, George G., to University of Saskatchewan. Anucleated live *E. coli* vaccine. 4,311,797, Cl. 435-172.000.
Kibler, Gordon M.: *See*—
Bovenkerk, Harold P.; and Kibler, Gordon M., 4,311,490, Cl. 51-307.000.
Kibun Company Limited: *See*—
Yoshizawa, Kiyoshi; Nojiro, Kikuo; Itoh, Masamitsu; Kiuchi, Hiroshi; and Horii, Kazuo, 4,311,721, Cl. 426-623.000.
Kiddie Products, Inc.: *See*—
Panicci, Richard L., 4,311,149, Cl. 128-359.000.
Kidney, Susan L. Modular telephone jack lock. 4,311,883, Cl. 179-189.00R.

Kiel, Hans-Jurgen; and Kuhn, Gebhard, to Jenoptik Jena G.m.b.H. Planet projection. 4,311,468, Cl. 434-286.000.

Kikkoman Corporation: *See—*
Nishizawa, Yoshihiko; Furukawa, Toshio; Goto, Teruo; and Onishi, Hirotsugu, 4,311,621, Cl. 260-17.200.

Kildea, Robert J., to United Technologies Corporation. Radial seal. 4,311,432, Cl. 415-134.000.

Kimura, Kenji, to Olympus Optical Co., Ltd. Phase corrected video recording system. 4,312,019, Cl. 360-22.000.

Kimura, Toshihiko: *See—*
Watanabe, Yushiyo; Kimura, Toshihiko; and Kurata, Masayuki, 4,311,219, Cl. 188-71.800.

King, James D.: *See—*
Anderson, Gordon K.; and King, James D., 4,311,261, Cl. 224-31.000.

King, William R., to Phillips Petroleum Co. Drying polymer solutions. 4,310,973, Cl. 34-10.000.

Kinzie, George R., to Sperry Corporation. Sieve overload sensor for alerting the operator of a combine of a sieve overload condition. 4,311,995, Cl. 340-684.000.

Kirby, Thomas J., to GTE Products Corporation. RF Power control apparatus. 4,312,032, Cl. 363-97.000.

Kircher, Morton S., to Olin Corporation. Method for assembling membrane electrolytic cells. 4,311,577, Cl. 204-255.000.

Kirkby, Larry L.: *See—*
Tung, Lu H.; Kirkby, Larry L.; and Lyons, Charles E., 4,311,819, Cl. 526-173.000.

Kitamura, Ryutaro; and Masubayashi, Hirotsugu, to Polyplastics Company, Ltd. Bag for cultivating mushrooms. 4,311,477, Cl. 493-195.000.

Kitashima, Satoyuki; and Nagira, Norichika, to Nippon Steel Corporation. Method and apparatus for controlling temper-rolled profile of cold rolled steel strip after continuous annealing. 4,311,030, Cl. 72-8.000.

Kitaura, Yoshihiko: *See—*
Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Imanaka, Hiroshi; Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; and Hashimoto, Masashi, 4,311,640, Cl. 260-112.50R.

Kiuchi, Hiroshi: *See—*
Yoshizawa, Kiyoshi; Nojiro, Kikuo; Itoh, Masamitsu; Kiuchi, Hiroshi; and Horii, Kazuo, 4,311,721, Cl. 426-623.000.

Kiwala, Jacob: *See—*
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,311,602, Cl. 252-8.600.
Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,311,754, Cl. 428-284.000.

Kiyozumi, Kentaro: *See—*
Nakamura, Tadashi; and Kiyozumi, Kentaro, 4,311,996, Cl. 340-711.000.

Klatt, Karl-Heinz; and Wenzl, Helmut, to Kernforschungsanlage Julich GmbH. FeTiMn Alloy granulate in a pressure container for storage of hydrogen and deuterium. 4,311,232, Cl. 206-0.700.

Kleinewefers GmbH: *See—*
Pav, Joseph; and Wenzel, Reinhard, 4,311,091, Cl. 100-161.000.

Kletch, Stanley J., to Bricmont & Associates, Inc. Blast furnace stove. 4,311,456, Cl. 432-30.000.

Klockner-Humboldt-Deutz AG: *See—*
Herchenbach, Horst; and Ramesohl, Hubert, 4,311,459, Cl. 432-247.000.

Klose, Volker: *See—*
Volkl, Franz; Adam, Gunter; and Klose, Volker, 4,311,308, Cl. 273-73.00G.

Knape, Richard S., to General Motors Corporation. Electromagnetic fuel injector with adjustable armature spring. 4,311,280, Cl. 239-585.000.

Kniep, Claus: *See—*
Weber, Jurgen; Falk, Volker; and Kniep, Claus, 4,311,854, Cl. 562-531.000.

Knight, Ernest, Jr.: *See—*
Ganfield, David J.; Hunkapiller, Michael W.; Knight, Ernest, Jr.; and Korant, Bruce D., 4,311,639, Cl. 260-112.50R.

Knowles, Alan N., to United Kingdom Atomic Energy Authority. High temperature gas cooled nuclear reactors. 4,311,559, Cl. 376-432.000.

Kobori, Toshio; and Sahara, Masayoshi, to Minolta Camera Kabushiki Kaisha. Exposure control system for camera. 4,311,371, Cl. 354-34.000.

Kobylinski, Thaddeus P.: *See—*
Pellegrini, John P., Jr.; Beach, David L.; and Kobylinski, Thaddeus P., 4,311,864, Cl. 585-530.000.

Kochsmeier, Ralph W., to DIT-MCO International Corporation. Apparatus for effecting electrical connections with multiple contact points. 4,311,352, Cl. 339-18.00R.

Kocks Technik GmbH & Co.: *See—*
Demny, Werner; and Moltner, Hermann, 4,311,033, Cl. 72-224.000.

Koda, Akio; Isaka, Ichiro; and Murakami, Yukiyasu, to Yamanouchi Pharmaceutical Co., Ltd. Cephalosporin compounds. 4,311,842, Cl. 544-27.000.

Kodera, Masao. Sprinkler brush assembly. 4,311,404, Cl. 401-287.000.

Koehler, Mark E.; Provder, Theodore; and Zander, Richard A. Disc centrifuge photosedimentometer. 4,311,039, Cl. 73-61.400.

Koerner, Gotz: *See—*
Weitemeyer, Christian; and Koerner, Gotz, 4,311,821, Cl. 528-15.000.

Kohsaka, Masanobu: *See—*
Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Imanaka, Hiroshi; Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; and Hashimoto, Masashi, 4,311,640, Cl. 260-112.50R.

Kohtani, Yutaka, to Canon Kabushiki Kaisha. Sound motion picture camera. 4,311,369, Cl. 352-91.00C.

Kojima, Yasuhumi; Nabeta, Teiichi; and Otuka, Fumio, to Nippondenso Co., Ltd. Control method and apparatus for air conditioners. 4,311,188, Cl. 165-2.000.

Kolb, William P., to Zoomar Corp. Gas laser assembly. 4,311,969, Cl. 331-94.50D.

Koll, Laurel A., to LeadRite Corporation. Lead calculator for moving targets. 4,311,902, Cl. 235-78.00R.

Kolze, Bruce A.: *See—*
Kolze, Melvin W.; and Kolze, Bruce A., 4,311,102, Cl. 110-103.000.

Kolze, Melvin W.; and Kolze, Bruce A. Burning system. 4,311,102, Cl. 110-103.000.

Komatsu, Kogiro: *See—*
Mabuchi, Kenichi; and Komatsu, Kogiro, 4,311,952, Cl. 320-3.000.

Komiya, Osamu, to Olympus Optical Co., Ltd. Apparatus for resecting tissue inside the body cavity utilizing high-frequency currents. 4,311,143, Cl. 128-303.150.

Kondo, Kenshi. Soldering of printed circuit boards. 4,311,265, Cl. 228-40.000.

Kondo, Kenshi. Soldering apparatus. 4,311,266, Cl. 228-40.000.

Konrad, William L.; and Clay, William L., to United States of America, Navy. Summing amplifier. 4,311,929, Cl. 307-529.000.

Kool-Fire Ltd.: *See—*
VanderVaart, Gerry, 4,311,191, Cl. 165-29.000.
VanderVaart, Gerry, 4,311,192, Cl. 165-29.000.

Koolatron Industries, Inc.: *See—*
Reed, Kingstone L. H.; Danchuk, William; and Hatcher, Ian, 4,311,017, Cl. 62-3.000.

Koper, Kenneth T., to United States of America, Navy. Arrestment system. 4,311,290, Cl. 244-110.00R.

Koppenhagen, Volker; Schlingmann, Gerhard; Dresow, Bernd; and Ebelmann, Ortrud, to Gesellschaft fur Biotechnologische Forschung mbH. Process for producing metal corrinoids. 4,311,643, Cl. 260-314.000.

Koppl, Franz: *See—*
Bugl, Erwin; Griesshammer, Rudolf; Lorenz, Helmut; Hamster, Helmut; and Koppl, Franz, 4,311,545, Cl. 156-613.000.

Korant, Bruce D.: *See—*
Ganfield, David J.; Hunkapiller, Michael W.; Knight, Ernest, Jr.; and Korant, Bruce D., 4,311,639, Cl. 260-112.50R.

Korik, Lazar: *See—*
Angers, John W.; and Korik, Lazar, 4,311,686, Cl. 424-1.000.

Kornfeld, Edmund C.: *See—*
Bach, Nicholas J.; and Kornfeld, Edmund C., 4,311,844, Cl. 546-84.000.

Koroschenko, Mikhail S.: *See—*
Glushko, Mikhail F.; Skalatsky, Viktor K.; Emelyanov, Vyacheslav G.; Korovainy, Sergei F.; Koroschenko, Mikhail S.; Solomkin, Leonid D.; and Stukalenko, Mikhail I., 4,311,001, Cl. 57-215.000.

Korovainy, Sergei F.: *See—*
Glushko, Mikhail F.; Skalatsky, Viktor K.; Emelyanov, Vyacheslav G.; Korovainy, Sergei F.; Koroschenko, Mikhail S.; Solomkin, Leonid D.; and Stukalenko, Mikhail I., 4,311,001, Cl. 57-215.000.

Kosarev, Nikolai T.: *See—*
Lebedev, Vladimir M.; Dynchik, Yan G.; Kosarev, Nikolai T.; Tanin-Shakhov, Vladilen S.; and Tarasov, Vladimir S., 4,311,200, Cl. 172-826.000.

Koster, Aloysius W. M. Method and apparatus for fabricating sheets of thermoplastic material. 4,311,657, Cl. 264-171.000.

Kowalski, Edward F.; Swidwa, Kenneth J.; and Hornak, Leonard P., to Westinghouse Electric Corp. Refueling machine for a nuclear reactor. 4,311,557, Cl. 376-271.000.

Koyama, Takaichi: *See—*
Iwamoto, Taro; Ando, Shimon; Kusumoto, Sho; Omae, Tsutomu; Suzuki, Toshitaka; Takidera, Masatake; Koyama, Takaichi; Hamada, Kunio; and Yoshida, Kazuhiro, 4,311,556, Cl. 376-249.000.

Kraemer, John F.: *See—*
Seeney, Charles E.; Kraemer, John F.; and Hoffman, Larry J., 4,311,619, Cl. 260-7.000.

Kraftwerk Union AG: *See—*
Bege, Dietmar; and Puthawala, Anwer, 4,311,531, Cl. 134-10.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Janner, Karl; Gregorius, Klaus; Niemann, Hans-Joachim; Kersting, Arno; and Schuster, Eberhard, 4,311,674, Cl. 423-3.000.

Kral, Stephen L., to Scovill Inc. Panic-type device having fusible section in push rod to avoid unintentional opening of door in event of fire. 4,311,329, Cl. 292-92.000.

Kranz, Gerhard, to Rollei-Werke Franke & Heidecke GmbH & Co. KG. Photographic camera with driving and stopping mechanism. 4,311,373, Cl. 354-43.000.

Krapcho, John, to E. R. Squibb & Sons, Inc. Derivatives of mercaptoacyl prolines and pipecolic acids. 4,311,697, Cl. 424-240.000.

Krape, Harry. Chimney cleaning apparatus. 4,310,942, Cl. 15-162.000.

Krasnobajew, Victor, to Givaudan Corporation. Microbiological transformations of ionone compounds. 4,311,860, Cl. 568-378.000.

Krause, Erich: *See—*
Sommer, Werner; Schieber, Hans; Krause, Erich; Radel, Franz; Trumper, Werner; Rieche, Henning; Tollkuhn, Dieter; Retallick, David; Weingartner, Albin; and Doslik, Peter R., 4,311,029, Cl. 66-75.200.

Krawczyk, Krzysztof: *See—*
Kajdas, Czesław; Nita, Jozef; and Krawczyk, Krzysztof, 4,311,036, Cl. 73-10.000.

Kressner, Bernhardt E., to Norton Company. Coated abrasive having brittle agglomerates of abrasive grain. 4,311,489, Cl. 51-298.000.

Kroll, Harley E.; and Thomsen, Donald L., to Tennant Company. Surface maintenance machine having air recirculation. 4,310,944, Cl. 15-346.000.

Kronenberg, Ernst A., to Sealing AG. Shaft seal. 4,311,315, Cl. 277-95.000.

Krude, Werner, to Uni-Cardan Aktiengesellschaft. Telescopic drive shaft. 4,311,027, Cl. 64-23.700.

Krueger, James E.; and Carpentier, Eugene A., to American Cyanamid Company. Amorphous coprecipitates of 4-(monoalkylamino) benzoic acid and derivatives and certain water-soluble materials. 4,311,694, Cl. 424-180.000.

Kruesi, Paul R.; and Frahm, Veryl H., Jr., to Cato Research Corporation. Process for the recovery of nickel, cobalt and manganese from their oxides and silicates. 4,311,520, Cl. 75-80.000.

Krumme, Hans-Jochen; and Schmitt, Guenter, to Siemens Aktiengesellschaft. Tomographic apparatus for producing transverse layer images. 4,311,911, Cl. 250-445.00T.

Kruschwitz, Werner, to Draftex Development AG. Channel-shaped sealing and finishing strips. 4,311,747, Cl. 428-122.000.

Kubo, Keishi; and Tanaka, Tetsuo, to Ricoh Company Limited. Thermo-sensitive multi-color recording material and process for preparation thereof. 4,311,750, Cl. 428-212.000.

Kudor, Toshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for controlling current type inverters. 4,312,031, Cl. 363-41.000.

Kuhn, Eberhard: *See—*
Ahne, Hellmut; Kuhn, Eberhard; Rubner, Roland; and Schmidt, Erwin, 4,311,785, Cl. 430-283.000.

Kuhn, Gebhard: *See—*
Kiel, Hans-Jurgen; and Kuhn, Gebhard, 4,311,468, Cl. 434-286.000.

Kumakura, Minoru: *See—*
Kaetsu, Isao; Kumakura, Minoru; Yoshida, Masaru; Shimaoka, Goro; and Urabe, Masanobu, 4,311,732, Cl. 427-164.000.

Kume, Kazunari, to Citizen Watch Company Limited. Electronic timepiece providing audible and visible time indications. 4,312,057, Cl. 368-63.000.

Kunz, Peter, to Mettler Instrumente AG. Electrical balance including a transversely arranged load compensation coil. 4,311,202, Cl. 177-212.000.

Kuramitsu, Hideki: *See—*
Itakura, Gen; Kuramitsu, Hideki; Takada, Yamato; Kuroda, Takayuki; and Irie, Yoshio, 4,311,729, Cl. 427-80.000.

Kuraray Company, Limited: *See—*
Moritani, Tohei; Yamauchi, Junnosuke; and Shiraishi, Makoto, 4,311,805, Cl. 525-60.000.

Kurata, Masayuki: *See—*
Watanabe, Yushiyo; Kimura, Toshihiko; and Kurata, Masayuki, 4,311,219, Cl. 188-71.800.

Kuribayashi, Tetsuzo; and Tsunematsu, Hiroshi, to Hitachi, Ltd. Method of controlling condensation system of steam plant. 4,311,013, Cl. 60-646.000.

Kuribayashi, Yasuji, to Victor Company of Japan, Limited. Signal level indication with different colors. 4,311,994, Cl. 340-661.000.

Kurioka, Shunichiro: *See—*
Kanbara, Youichi; and Kurioka, Shunichiro, 4,311,761, Cl. 428-397.000.

Kuroda, Osamu: *See—*
Matsuzaki, Harumi; Kuroda, Osamu; Okouchi, Isao; Izumi, Kenkichi; and Takahashi, Sankichi, 4,311,575, Cl. 204-180.00P.

Kuroda, Takayuki: *See—*
Itakura, Gen; Kuramitsu, Hideki; Takada, Yamato; Kuroda, Takayuki; and Irie, Yoshio, 4,311,729, Cl. 427-80.000.

Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Imanaka, Hiroshi; Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; and Hashimoto, Masashi, to Fujisawa Pharmaceutical Co., Ltd. Peptide, process for preparation thereof and use thereof. 4,311,640, Cl. 260-112.50R.

Kurosaki, Yasuhide: *See—*
Kadowaki, Hidejiro; Kurosaki, Yasuhide; Aoki, Takao; and Iwami, Naoki, 4,311,778, Cl. 430-54.000.

Kurth, William T.; and Andrulitis, William B., to Exxon Research & Engineering Co. Solar cell modules. 4,311,869, Cl. 136-246.000.

Kushida, Osami, to Texas Instruments Incorporated. Fast idle carburetor system. 4,311,653, Cl. 261-39.00A.

Kuss Corporation: *See—*
Benjamin, Gary L., 4,310,936, Cl. 5-450.000.

Kusumoto, Sho: *See—*
Iwamoto, Taro; Ando, Shimon; Kusumoto, Sho; Omae, Tsutomu; Suzuki, Toshitaka; Takidera, Masatake; Koyama, Takaichi; Hamada, Kunio; and Yoshida, Kazuhiro, 4,311,556, Cl. 376-249.000.

Kwauka, Gerd-Georg: *See—*
Dudziak, Ernst; Kwauka, Gerd-Georg; Plate, Arthur; and Lubeck, Hermann, 4,311,090, Cl. 100-3.000.

L.C.C.-C.I.C.E. Compagnie Europeenne de Composants Electroniques: *See—*
Frappart, Pierre; Guichard, Serge; and Saint Marcoux, Roland, 4,312,023, Cl. 361-243.000.

La Conti, Anthony B.: *See—*
Dempsey, Russell M.; Fragala, Anthony R.; La Conti, Anthony B.; and Enos, John F., 4,311,569, Cl. 204-129.000.

Lacy, F. Hilton, Jr.; and Weis, Christopher H., to Lockwood Corporation. Method for separating clods and the like from potatoes. 4,311,241, Cl. 209-570.000.

Lake Center Industries: *See—*
Pathmann, Charles E., 4,311,946, Cl. 318-663.000.

Lambert, Lloyd J., Jr.; and Lambert, Lloyd J., Sr. Chest and bust machine. 4,311,305, Cl. 272-118.000.

Lambert, Lloyd J., Sr.: *See—*
Lambert, Lloyd J., Jr.; and Lambert, Lloyd J., Sr., 4,311,305, Cl. 272-118.000.

Lamparsky, Dietmar: *See—*
Kaiser, Roman; and Lamparsky, Dietmar, 4,311,718, Cl. 426-538.000.

Landt, Harvey L.; and Mooty, Donald J., to Rockwell International Corporation. High speed antenna coupler. 4,311,972, Cl. 333-17.00M.

Lang, Frank B.; Gibson, John J.; and Ross, Michael D., to RCA Corporation. Non-linear aperture correction circuit. 4,312,013, Cl. 358-8.000.

Lang, Paul W., to Payton, Raymus K. Annular scanning light pulse system. 4,311,357, Cl. 350-6.900.

Lange, Francois, to Smh-Adrex. Device for projecting ink droplets onto a medium. 4,312,009, Cl. 346-140.00R.

Langevin, Bernard, to Commissariat a l'Energie Atomique. Disassemblable device for fitting a device between the opposite ends of two pipes. 4,311,163, Cl. 137-315.000.

Langlois, Roland E.: *See—*
Roberson, Cletis L.; and Langlois, Roland E., 4,311,500, Cl. 65-2.000.

Lanier Business Products, Inc.: *See—*
Bolick, Fred C., Jr., 4,312,021, Cl. 360-132.000.

Lansing Bagnall Limited: *See—*
Goodacre, Ronald; and Piper, Ronald W., 4,311,205, Cl. 180-68.500.

Lanter, Kent J.: *See—*
Betz, Norman L.; Lanter, Kent J.; and Williams, Danny L., 4,311,713, Cl. 426-2.000.

La Passo, Leonard J.; and Benoit, Harry, to Motion Control, Inc. Thermometer. 4,311,049, Cl. 73-362.400.

LaPorte, Thomas A. Two-position aerodynamic mirror. 4,311,362, Cl. 350-293.000.

LaRosa, Richard, to Hazeltine Corporation. Apparatus for generating constant-envelope, angle-modulated pulse signals. 4,311,971, Cl. 332-9.00R.

Lartillot, Alain: *See—*
Benoit, Michel; Gerlach, Pierre; Grolleau, Claude; and Lartillot, Alain, 4,311,975, Cl. 333-207.000.

Latimer, John P., to Deepsea Ventures, Inc. Dredge head with mechanical and pumping action. 4,311,342, Cl. 299-8.000.

Lauersdorf, Duane H.; and Camp, Larry A., to Wisconsin Oven Corp. Insulated industrial oven. 4,311,460, Cl. 432-247.000.

Launay, Noel, to Societe d'Assistance Technique pour Produits Nestle S.A. Food product moulding process. 4,311,716, Cl. 426-275.000.

Lawes, Bernard C.: *See—*
DeVries, Frederick W.; and Lawes, Bernard C., 4,311,341, Cl. 299-5.000.

Lazare, Louis S.: *See—*
Rucktenwald, Thomas E.; Braun, William E., Jr.; Lazare, Louis S.; Lin, Sharming; and Melcher, Byron, 4,311,076, Cl. 84-1.030.

Lazzari, Jean-Pierre, to Compagnie Internationale pour l'Informatique CII Honeywell Bull (Societe Anonyme). Method for multilayer circuits and methods for making the structure. 4,311,727, Cl. 427-58.000.

LCOA Laminating Company of America: *See—*
Block, James P., 4,311,419, Cl. 408-1.00R.

LeadRite Corporation: *See—*
Koll, Laurel A., 4,311,902, Cl. 235-78.00R.

Leah, Paul M.: *See—*
Benjamin, Fred W.; and Leah, Paul M., 4,311,211, Cl. 186-53.000.

Leandri, Jacqueline: *See—*
Rey, Pierre; Leandri, Jacqueline; and Abbou, Clement, 4,311,659, Cl. 264-221.000.

Leanza, William J.: *See—*
Christensen, Burton G.; Leanza, William J.; Shih, David H.; and Wildonger, Kenneth J., 4,311,704, Cl. 424-274.000.

Lear Siegler, Inc.: *See—*
DeJonge, Michael K., 4,312,041, Cl. 364-442.000.

Lebedev, Vladimir M.; Dynchik, Yan G.; Kosarev, Nikolai T.; Tanin-Shakhov, Vladilen S.; and Tarasov, Vladimir S. Bulldozer. 4,311,200, Cl. 172-826.000.

Lebet, Jean-Pierre: *See—*
Bonnet, Jaques; and Lebet, Jean-Pierre, 4,311,156, Cl. 131-274.000.

Le Clerc, Bernard: *See—*
Bert, Alain; and Le Clerc, Bernard, 4,311,970, Cl. 331-107.00R.

Lee, Gim F., Jr., to General Electric Company. Modified polyphenylene ether compositions. 4,311,633, Cl. 260-42.180.

Lee, Robert G. H.: *See—*
Savard, Guy; and Lee, Robert G. H., 4,311,518, Cl. 75-59.000.

Lees, Robert; and Jones, Marvin C., to Allied Corporation. Low shear gravity controlled yarn finish supply system. 4,311,114, Cl. 118-694.000.

Leibowitz, Michael W.: *See—*
Balzer, Gerry C.; Gordon, Alan M.; Leibowitz, Michael W.; and Wittig, Karl R., 4,311,880, Cl. 179-99.00H.

Lemahieu, Raymond G.; Moelants, Felix J.; and Ville, Frans J., to Agfa-Gevaert, N.V. Photographic silver halide materials containing dispersed light-absorbing merostyryl dyes. 4,311,787, Cl. 430-522.000.

Leming, Colin A.: *See—*
Clark, Alan D.; Harvey, Richard P.; and Leming, Colin A., 4,311,366, Cl. 350-445.000.

Leo, Bruno S., to Hughes Aircraft Company. Screw compressor-expander cryogenic system with mist lubrication. 4,311,021, Cl. 62-402.000.

Leonard, Ian C. A., to National Research Development Corporation. Drive mechanism. 4,311,080, Cl. 87-44.000.

Leong, Koon-Wah, to Kendall Company, The. Article having organo-phosphonitrile rubber coating bonded to natural or synthetic rubber and method of making. 4,311,736, Cl. 427-331.000.

Le Parquier, Guy: *See—*
Felix, Pierre; and Le Parquier, Guy, 4,311,906, Cl. 250-349.000.

Le Taurneau, Gary M.: *See—*
Crawford, Donald C.; and Le Taurneau, Gary M., 4,311,230, Cl. 198-457.000.

Levitt, Myron B. Transducer head having pin type connectors. 4,311,356, Cl. 339-99.00R.

Levy, Richard C.: *See—*
Dankman, Scott; Levy, Richard C.; and McCoy, Bryan, 4,311,310, Cl. 273-109.000.

Lewis, Arlin C. Solar-wind energy conversion system. 4,311,011, Cl. 60-641.150.

Lewis, John W. R.; and Esner, Mark E., to Howard Wall Limited. Buckle. 4,310,954, Cl. 24-230.00A.

Licentia Patent-Verwaltungs GmbH: *See—*
Kasper, Erich; and Weber, Suso, 4,311,743, Cl. 428-64.000.
Nuding, Erich; and Hirsch, Gerhard, 4,311,973, Cl. 333-33.000.

Life Savers, Inc.: *See—*
Vink, Walter; and Deptula, Richard W., 4,311,722, Cl. 426-660.000.

Liguori, Tom, to National Pen Corporation. Ball-point pen device. 4,311,403, Cl. 401-209.000.

Lilley, Roy J., Jr.: *See—*
Crescentini, Lamberto; Blackman, Webb B., Jr.; DeCaprio, Joseph D.; Fisher, William B.; Lilley, Roy J., Jr.; and Wagner, John W., 4,311,642, Cl. 260-239.30A.

Lim, Franklin: *See—*
Buehler, Robert J.; Chan, Teresa H.; and Lim, Franklin, 4,311,690, Cl. 424-1.000.

Lim, Linda W., to GTE Automatic Electric Laboratories, Inc. Method of screening paste solder onto leaded hybrid substrates. 4,311,267, Cl. 228-180.00A.

Lin, Sharming: *See—*
Rucktenwald, Thomas E.; Braun, William E., Jr.; Lazare, Louis S.; Lin, Sharming; and Melcher, Byron, 4,311,076, Cl. 84-1.030.

Lindahl, Eugenie Z.: *See—*
Schreiber, Hinda S.; Lindahl, Eugenie Z.; and Smith, Polly P., 4,311,150, Cl. 128-494.000.

Linde Aktiengesellschaft: *See—*
Fabian, Rainer, 4,311,496, Cl. 62-17.000.

Linden, Hans B. Field desorption ionization. 4,311,910, Cl. 250-423.00R.

Lindkvist, Erik A. Device for use in apparatus for thermal spraying. 4,311,275, Cl. 239-102.000.

Lingl Corporation: *See—*
Brugger, Karl; and Schwarz, Josef, 4,311,073, Cl. 83-23.000.

Lipowitz, Jonathan: *See—*
Kalinowski, Robert E.; and Lipowitz, Jonathan, 4,311,760, Cl. 428-391.000.

Lipsky, Alan H., to Subcom, Inc. Range and depth detection system. 4,312,053, Cl. 367-127.000.

Liska, Georg, to Zahnradfabrik Friedrichshafen, AG. Radial piston pump. 4,311,437, Cl. 417-273.000.

List, Hans: *See—*
Freyn, Fritz; and Greier, Josef, 4,311,120, Cl. 123-192.00B.

Litzinger, Paul C., to Crown Zellerbach Corporation. Novel aggregate composition and method for making same. 4,311,115, Cl. 119-1.000.

Lockwood Corporation: *See—*
Lacy, F. Hilton, Jr.; and Weis, Christopher H., 4,311,241, Cl. 209-570.000.

Lombardi, Frank: *See—*
United States of America, National Aeronautics and Space Administration; and Lombardi, Frank, 4,311,057, Cl. 74-18.100.

London, Joe F., Jr.; and Pugh, Charles D., to Burlington Industries, Inc. Novelty yarn production. 4,311,000, Cl. 57-6.000.

Long, Bryan R. Power cylinder balancer unit. 4,311,040, Cl. 73-115.000.

Lopez, Jose G.: *See—*
Stana, Regis R.; Mitchell, Edward; Rudolph, Joseph S.; and Lopez, Jose G., 4,311,675, Cl. 423-8.000.

L'Oreal: *See—*
Bugaut, Andree; Genet, Alain R.; and Dossou, Koovi G., 4,311,478, Cl. 8-407.000.

Lorenz, Helmut: *See—*
Bugl, Erwin; Griesshammer, Rudolf; Lorenz, Helmut; Hamster, Helmut; and Koppl, Franz, 4,311,545, Cl. 156-613.000.

Lotsch, Wolfgang, to BASF Aktiengesellschaft. Isoindoline colorants. 4,311,527, Cl. 106-22.000.

Lougaridge, Mark, to International Business Machines Corporation. Shift sensitive dual velocity mechanism for a printer. 4,311,400, Cl. 400-166.000.

Louis Marx & Co., Inc.: *See—*
Crosman, Dorland L., 4,311,311, Cl. 273-121.00A.

Louvers & Dampers, Inc.: *See—*
White, Thomas B., 4,310,993, Cl. 52-473.000.

Lovero, Vito R.: *See—*
Grieco, Frank G.; and Lovero, Vito R., 4,311,257, Cl. 222-387.000.

Lubeck, Hermann: *See—*
Dudziak, Ernst; Kwauka, Gerd-Georg; Plate, Arthur; and Lubeck, Hermann, 4,311,090, Cl. 100-3.000.

Lucas Industries Limited: *See—*
Holt, William D.; and Robinson, John M., 4,311,961, Cl. 324-418.000.
Stratton, John F., 4,311,277, Cl. 239-400.000.

Lucas, Robert C., to Standard Oil Company (Indiana). Multidimensional amplitude scaling of seismic data. 4,312,050, Cl. 367-44.000.

Luce, Betty M.: *See—*
Berdan, Betty L.; and Luce, Betty M., 4,311,768, Cl. 428-626.000.

Luckey, George W.; and Towers, Christine M., to Eastman Kodak Company. Recrystallization of activated rare-earth oxyhalide phosphors. 4,311,487, Cl. 23-305.0RE.

Ludwig Taprogge Reinigungsanlagen fur Rohren-Warmeaustauscher: *See—*
Eimer, Klaus; Thal, Heinz; and Mindel, Dieter, 4,311,591, Cl. 210-405.000.

Lum, Albert C. H., to D.S.L. Inc. Door latch. 4,311,330, Cl. 292-210.000.

Lundgren, Bengt, to SKF Nova AB. Device for transforming rotational movement into linear movement or the reverse. 4,311,058, Cl. 74-89.000.

Lurry, Percell C. Ladder attachment. 4,311,207, Cl. 182-206.000.

Luscher, Jakob; and Rusznyak, Andreas, to Ebauches SA. Device for regulating the threshold voltages of I.G.F.E.T. transistors circuitry. 4,311,923, Cl. 307-304.000.

Lusk, Frank J.: *See—*
Gdovin, David P.; and Lusk, Frank J., 4,310,974, Cl. 434-42.000.

Lutz, Manfred, to Fichtel & Sachs AG. Clutch assembly for door lock system. 4,311,331, Cl. 292-336.300.

Luyckx, Leon A. Titanium-boron additive alloys. 4,311,523, Cl. 75-175.500.

Luzynski, Anthony J. Magnetic switch. 4,311,981, Cl. 338-32.00H.

Lyons, Charles E.: *See—*
Tung, Lu H.; Kirkby, Larry L.; and Lyons, Charles E., 4,311,819, Cl. 526-173.000.

Lyons, William C.; Rofer-DePoorter, Cheryl K.; Buddecke, Donald B.; and Zublin, Edward A. Uranium leeching process and insitu mining. 4,311,340, Cl. 299-4.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See—*
Abendroth, Paul; and Emrich, Helmust, 4,311,093, Cl. 101-232.000.

M.C.B.: *See—*
Taillebois, Jacques A. J., 4,311,987, Cl. 340-347.00P.

Mabuchi, Kenichi; and Komatsu, Kogiro, to Mabuchi Motor Co. Ltd. Battery charging system. 4,311,952, Cl. 320-3.000.

Mabuchi Motor Co. Ltd.: *See—*
Mabuchi, Kenichi; and Komatsu, Kogiro, 4,311,952, Cl. 320-3.000.

Machida Endoscope Co., Ltd.: *See—*
Machida, Haruhiko, 4,311,142, Cl. 128-303.100.

Machida, Haruhiko, to Machida Endoscope Co., Ltd. Device for detecting a leak of laser. 4,311,142, Cl. 128-303.100.

Mack, Mark P., to Conoco Inc. Rapid phase transformation for poly(butene-1). 4,311,571, Cl. 204-158.00S.

Macrorie, Patrick L.; Rohrenbacher, Ronald C.; and Austin, Stephen B. Ladder safety lamp. 4,311,208, Cl. 182-18.000.

Madni, Asad M., to Systron Donner Corporation. Apparatus for connecting data points on a cathode ray tube display and method therefor. 4,311,997, Cl. 340-722.000.

Maestro, Patrick: *See—*
Demazeau, Gerard; Maestro, Patrick; Plante, Theophile; Pouchard, Michel; and Hagenmuller, Paul, 4,311,770, Cl. 428-694.000.

Maffei, Carlo. Baby bottle for bottle feeding and other uses. 4,311,245, Cl. 215-11.00B.

Mages, Bernhard: *See—*
Rock, Erich; and Mages, Bernhard, 4,310,948, Cl. 16-335.000.

Maier, Alois: *See—*
Opavsky, Werner; Reisner, Josef; and Maier, Alois, 4,311,563, Cl. 203-46.000.

Malchesky, Paul S.: *See—*
Nose, Yukihiko; and Malchesky, Paul S., 4,311,587, Cl. 210-136.000.

Maldarelli, Lawrence V., to Bell & Howell Company. Methods and apparatus for recording information supplying wound materials and retaining tubular objects. 4,312,006, Cl. 346-136.000.

Manabe, Sugio, to Olympus Optical Company Limited. Automatic analytical apparatus. 4,311,394, Cl. 356-440.000.

Mandai, Masaaki; Torisawa, Akira; Ueda, Makoto; Asano, Kazuhiro; Shida, Masaharu; and Satoh, Katsuhiko, to Kabushiki Kaisha Daini Seikosha. Electronic timepiece. 4,312,059, Cl. 368-157.000.

Mandai, Masaaki: *See—*
Ueda, Makoto; Torisawa, Akira; Otawa, Shuji; Mandai, Masaaki; Shida, Masaharu; and Sato, Katsuhiko, 4,311,947, Cl. 318-696.000.

Manfre', Giovanni; and Pellegrini, Vittorio, to Centro Ricerche Fiat S.p.A. Method and apparatus for continuously producing very small

diameter metal wire having a glass coating thereover. 4,311,506, Cl. 65-59.600.

Mannesmann Aktiengesellschaft: *See*—
Hiersig, Heinz M.; and Steinberg, Hans. 4,311,472, Cl. 440-75.000.
Ries, Karl; Hannoschock, Kurt; Rozic, Krsto-Marijan; Basler, Gunter; Sperl, Harald; and Weinschenk, Kurt. 4,311,905, Cl. 250-321.000.
Schuhmann, Bernd. 4,311,066, Cl. 74-687.000.

Mannesmann DeMag AG: *See*—
Becker, Klaus; and Wolski, Karlheinz. 4,311,215, Cl. 188-8.000.

Manoury, Philippe M. J.; Cavero, Icilio A. G.; Najer, Henry; and Giudicelli, Don P. R. L., to Synthelabo. Phenol ethers. 4,311,708, Cl. 424-330.000.

Mantec Industries Limited: *See*—
Scragg, Frederick; Scragg, Michael L.; and Marshman, Peter, 4,311,441, Cl. 417-383.000.

Manziek, Larry, to Rohm and Haas Company. Borane reducing resins. 4,311,811, Cl. 525-332.000.

Manziek, Larry, to Rohm and Haas Company. Borane reducing resins. 4,311,812, Cl. 525-337.000.

Marchem Products Company: *See*—
Salzman, Allen W., 4,311,350, Cl. 308-160.000.

Marconi Company Limited: *See*—
Stewart, Douglas E., 4,312,002, Cl. 343-725.000.

Marion Health and Safety, Inc.: *See*—
Avery, Carl F., 4,311,792, Cl. 435-30.000.

Marmo, Don; and Rocco, Frank L., to International Flavors & Fragrances Inc. Process for producing a flavored heated beverage. 4,311,720, Cl. 426-594.000.

Maroist, Jules. Fireproof suit. 4,310,926, Cl. 2-81.000.

Marsalka, Joseph P.; and Kennedy, John P., to Mirrorcraft, Inc. Auxiliary mirror attachment unit for rear view mirror. 4,311,363, Cl. 350-299.000.

Marsh, Ronald P., to True Temper Corporation. Variable thickness fabric mat for railway track structure and method. 4,311,273, Cl. 238-1.000.

Marshall, Christie A.; and Scalera, Michael R., to B. F. Goodrich Company, The. Tire sidewall bump/depression detection system. 4,311,044, Cl. 73-146.000.

Marshman, Peter: *See*—
Scragg, Frederick; Scragg, Michael L.; and Marshman, Peter, 4,311,441, Cl. 417-383.000.

Martin, Harold W.: *See*—
Buckley, Galen L.; and Martin, Harold W., 4,311,382, Cl. 356-5.000.

Martin, Lawrence L.; Ong, Helen H.; Anderson, Vernon B.; and Crichlow, Charles A., to American Hoechst Corporation. Antidepressant and tranquilizing (α-phenyl-2-tolyl)-azacycloalkenes. 4,311,703, Cl. 424-263.000.

Martin, William G.: *See*—
Conner, Wayne L.; and Martin, William G., 4,311,494, Cl. 55-394.000.

Marzolf, Rene, to VDO Adolf Schinling AG. Device for the transmission of measured values. 4,312,001, Cl. 340-870.160.

Maschinenfabrik Augsburg-Nuernberg Aktiengesellschaft: *See*—
Geyer, Ludwig; and Jarauch, Franz, 4,311,336, Cl. 296-201.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Jacob, Eberhard; and Bacher, Walter, 4,311,678, Cl. 423-19.000.

Maslanka, William W.; and Spence, Gavin G., to Hercules Incorporated. Organic figments. 4,311,809, Cl. 525-286.000.

Massaroli, Giangiacomo, to Poli Industria Chimica S.p.A. Imidazo[1,2-a]pyridines having anti-ulcer activity. 4,311,702, Cl. 424-256.000.

Masse, Lucien; Medlin, W. Louis; and Sexton, James H., to Mobil Oil Corporation. Method of identifying gas, oil and water zones in a subsurface formation. 4,312,049, Cl. 367-35.000.

Massie, Norbert A.: *See*—
Hodson, Donald R.; and Massie, Norbert A., 4,311,360, Cl. 350-174.000.

Masson, Jean C.: *See*—
Schapira, Joseph; Ken, Victor; Masson, Jean C.; and Duboys, Francois J., 4,311,536, Cl. 148-6.15R.

Masubayashi, Hirotsugu: *See*—
Kitamura, Ryutaro; and Masubayashi, Hirotsugu, 4,311,477, Cl. 493-195.000.

Masujima, Sho: *See*—
Iwaya, Shoichi; and Masujima, Sho, 4,312,026, Cl. 361-321.000.

Matherat, Philippe, to Thomson-CSF. Vector generator for a graphic console. 4,311,998, Cl. 340-731.000.

Matsumura, Akira: *See*—
Endo, Hiroshi; Baba, Kousaku; and Matsumura, Akira, 4,311,876, Cl. 179-15.5ST.

Matsumura, Kenichi; Mizuguchi, Shinichi; Onoda, Tadayuki; Hamada, Tsutomu; and Noda, Hisato, to Matsushita Electric Industrial Co., Ltd. Electrostatic photocopying apparatus with improved developer supply means. 4,311,110, Cl. 118-50.100.

Matsumura, Takeshi: *See*—
Yazaki, Susumu; and Matsumura, Takeshi, 4,311,392, Cl. 356-375.000.

Matsuoka, Shigeru: *See*—
Tsubaki, Toshio; Tokunaga, Takeshi; Yonekura, Seiji; Matsuoka, Shigeru; Miura, Makoto; and Yamauchi, Kozi, 4,311,225, Cl. 192-142.00R.

Matsushita Electric Industrial Co., Inc.: *See*—
Itakura, Gen; Kuramitsu, Hideki; Takada, Yamato; Kuroda, Takayuki; and Irie, Yoshio, 4,311,729, Cl. 427-80.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Matsumura, Kenichi; Mizuguchi, Shinichi; Onoda, Tadayuki; Hamada, Tsutomu; and Noda, Hisato, 4,311,110, Cl. 118-50.100.
Watanabe, Masahiro; and Horikawa, Hiroshi, 4,311,963, Cl. 328-163.000.

Matsushita Electric Works, Ltd.: *See*—
Sauer, Hans; Kasano, Humihiro; and Isobe, Yoichi, 4,311,976, Cl. 335-78.000.

Matsuura, Takashi: *See*—
Motomura, Reiji; Ohta, Hirofumi; Matsuura, Takashi; and Itaya, Kou, 4,311,364, Cl. 350-318.000.

Matsuura, Tsuyoshi, to Olympus Optical Co., Ltd. Light measuring circuit for photographic cameras. 4,311,375, Cl. 354-60.00R.

Matsuzaki, Harumi; Kuroda, Osamu; Okouchi, Isao; Izumi, Kenkichi; and Takahashi, Sankichi, to Hitachi, Ltd.; and Babcock-Hitachi Kabushiki Kaisha. Method for high temperature electrodialysis. 4,311,575, Cl. 204-180.00P.

Matteson, Lawrence J., to Eastman Kodak Company. Identifying cassettes loaded in cameras. 4,311,377, Cl. 354-217.000.

Mattor, John A., to Scott Paper Company. Release coatings. 4,311,766, Cl. 428-514.000.

Matumoto, Michiaki; and Mimori, Sadao, to Hitachi, Ltd. Burner. 4,311,451, Cl. 431-352.000.

Maurer, Ruprecht, to Ringspann Albrecht Maurer K.G. Safety catch for elevators, lifting platforms, and the like. 4,311,220, Cl. 188-170.000.

Maurice, Joe G. All purpose cleaner. 4,311,608, Cl. 252-143.000.

Maximilien, Jacques: *See*—
Dameret, Jean-Louis; Maximilien, Jacques; and Paret, Jacques, 4,311,155, Cl. 131-280.000.

Mayer, Werner. Method for operating an internal combustion engine and internal combustion engine for carrying out this method. 4,311,127, Cl. 123-557.000.

Mayhan, Kenneth G.; Janssen, Robert A.; and Bertrand, William J., to American Hospital Supply Corporation. Process for graft copolymerization of a pre-formed substrate. 4,311,573, Cl. 204-159.150.

McArthur, Dennis P.: *See*—
Baron, Kenneth; and McArthur, Dennis P., 4,311,581, Cl. 208-115.000.

McBee, William C.; and Sullivan, Thomas A., to United States of America, Commerce. Modified sulfur cement. 4,311,826, Cl. 528-389.000.

McCann, Mary E., to PPG Industries, Inc. Electrolyte permeable diaphragm. 4,311,566, Cl. 204-98.000.

McCoy, Bryan: *See*—
Dankman, Scott; Levy, Richard C.; and McCoy, Bryan, 4,311,310, Cl. 273-109.000.

McCullough, J. Douglas, Jr.; and Rhodes, Louis C., to Shell Oil Company. Polybutylene modified masterbatches for impact resistant polypropylene. 4,311,807, Cl. 525-197.000.

McDonnell Douglas Corporation: *See*—
Palmer, Raymond J., 4,311,661, Cl. 264-510.000.

McGinley, Emanuel J., to FMC Corporation. Stabilizing agent for dry mix food products. 4,311,717, Cl. 426-330.200.

McGraw-Edison Company: *See*—
Tenniswood, David M., 4,311,293, Cl. 248-49.000.

McHose, Robert E.: *See*—
Faulkner, Richard D.; and McHose, Robert E., 4,311,939, Cl. 313-95.000.

McMillan, Charles G. Electric baseboard heat storage apparatus and method of conversion. 4,311,898, Cl. 219-378.000.

Meckstroth, Alan F.; and Pease, James F. Hose clamp with tangential screw. 4,310,956, Cl. 24-279.000.

Medlin, W. Louis: *See*—
Masse, Lucien; Medlin, W. Louis; and Sexton, James H., 4,312,049, Cl. 367-35.000.

Medtronic, Inc.: *See*—
Smits, Karel F. A. A., 4,311,153, Cl. 128-785.000.

Megles, John E., Jr.: *See*—
Danielson, Paul S.; and Megles, John E., Jr., 4,311,529, Cl. 501-32.000.

Mehta, Ashokkumar D.: *See*—
Frank, Howard; Swafford, John W., Jr.; Farazi, Perry; Patel, Arvind M.; Chan, Cheuk-Wah; Dohnal, Edward J.; Wang, Clark S.; and Mehta, Ashokkumar D., 4,312,043, Cl. 364-551.000.

Melcher, Byron: *See*—
Rucktenwald, Thomas E.; Braun, William E., Jr.; Lazare, Louis S.; Lin, Sharming; and Melcher, Byron, 4,311,076, Cl. 84-1.030.

Melnick, Joseph L.; and Wallis, Craig, to Baylor College of Medicine. Determination of bacterial growth activity and antibiotic sensitivity by catalase measurement. 4,311,794, Cl. 435-32.000.

Menzies, Murray A.; and Stevenson, William G. Internal combustion engines. 4,311,119, Cl. 123-80.0BB.

Merck & Co., Inc.: *See*—
Christensen, Burton G.; Leanza, William J.; Shih, David H.; and Wildonger, Kenneth J., 4,311,704, Cl. 424-274.000.
Dybas, Richard A.; Grier, Nathaniel; and Witzel, Bruce E., 4,311,709, Cl. 424-330.000.
Hernandez, Sebastian; Zimmerman, Sheldon B.; Gullo, Vincent P.; and Dewey, Ray S., 4,311,693, Cl. 424-122.000.
Kang, Kenneth S.; and Veeder, George T., 4,311,795, Cl. 435-101.000.
Racciato, Joseph S., 4,311,601, Cl. 252-8.600.

Merz, Kenneth M., to TRW, Inc. Liquid level sensing means. 4,311,048, Cl. 73-293.000.

Meshberg, Philip. Hand held container and dispenser assembly. 4,311,255, Cl. 222-183.000.

Messer, John A. Method for making shatter-resistant mirror. 4,311,731, Cl. 427-162.000.

Messina, Joseph, to Cancelliere, Michael, a part interest. Grid system for laying out and/or precutting tiles or the like. 4,311,464, Cl. 434-74.000.

Messwandler-Bau GmbH: *See—*
Graul, Otto, 4,311,979, Cl. 336-205.000.

Meteer, Charles L.: *See—*
Brueggemann, Walter H.; and Meteer, Charles L., 4,311,751, Cl. 428-212.000.

Mettler Instrumente AG: *See—*
Kunz, Peter, 4,311,202, Cl. 177-212.000.
Strobel, Felix, 4,311,993, Cl. 340-641.000.

Miale, Joseph N.: *See—*
Chen, Nai-Yuen; Miale, Joseph N.; and Reagan, William J., 4,311,865, Cl. 585-640.000.

Mich, Thomas F.: *See—*
Haskell, Theodore H.; Mich, Thomas F.; Schweiss, Dietrich; and Culbertson, Townley P., 4,311,698, Cl. 424-246.000.
Haskell, Theodore H.; Mich, Thomas F.; Sanchez, Joseph P.; and Schweiss, Dietrich, 4,311,699, Cl. 424-246.000.

Michelson, Anatol. Assembly for forming hollow foundry products. 4,311,184, Cl. 164-165.000.

Micro-Mega, S.A.: *See—*
Gaillard, Roger, 4,311,169, Cl. 137-556.000.

Middleton, William J., to Du Pont de Nemours, E. I., and Company. Fluoroalkoxysulfur fluorides. 4,311,651, Cl. 260-543.00H.

Midland-Ross Corporation: *See—*
Jackovitz, Frank J., 4,311,422, Cl. 411-112.000.

Midorikawa, Heihatiro: *See—*
Itoh, Masahiko; Midorikawa, Heihatiro; and Minato, Akira, 4,311,024, Cl. 62-474.000.

Mifune, Hiroyuki; Takada, Shunji; Akimura, Yoshitaka; and Sakai, Nobuo, to Fuji Photo Film Co., Ltd. Highly-sensitive high-contrast photographic materials. 4,311,781, Cl. 430-264.000.

Milazzo, Carl J., to Hohl Machine & Conveyor Co., Inc. Accumulating conveyor. 4,311,231, Cl. 198-781.000.

Miller, Alistair A.: *See—*
Roth, Barbara; Miller, Alistair A.; and Sawyer, David A., 4,311,701, Cl. 424-249.000.

Miller, Donald K., to Borg-Warner Corporation. Desuperheater control system in a refrigeration apparatus. 4,311,498, Cl. 62-181.000.

Miller, John D.: *See—*
Fant, B. T.; Miller, John D.; and Ryan, D. F., 4,311,578, Cl. 208-8.0LE.

Miller, Robert C.: *See—*
Goss, Gary J.; and Miller, Robert C., 4,312,068, Cl. 371-37.000.

Miller, Stephen D.: *See—*
Frederick, Louis J.; Hoke, Kenneth E.; Greene, Jerrold W.; and Miller, Stephen D., 4,311,430, Cl. 414-786.000.

Miller, Terry A., to Phillips Petroleum Company. Data display. 4,312,051, Cl. 367-68.000.

Mimori, Sadao: *See—*
Matumoto, Michiaki; and Mimori, Sadao, 4,311,451, Cl. 431-352.000.

Minato, Akira: *See—*
Itoh, Masahiko; Midorikawa, Heihatiro; and Minato, Akira, 4,311,024, Cl. 62-474.000.

Mindel, Dieter: *See—*
Eimer, Klaus; Thal, Heinz; and Mindel, Dieter, 4,311,591, Cl. 210-405.000.

Mine Safety Appliances Company: *See—*
Robbins, Henry M., Jr., 4,312,003, Cl. 343-788.000.

Minemet Recherche: *See—*
Demarthe, Jean-Michel; and Solar, Serge, 4,311,676, Cl. 423-10.000.

Ministry of International Trade & Industry: *See—*
Abe, Minoru, 4,311,434, Cl. 416-142.000.
Ohtsubo, Junji, 4,311,383, Cl. 356-28.500.

Minnesota Mining and Manufacturing Company: *See—*
Wong, Andrew H., 4,311,741, Cl. 428-35.000.

Minolta Camera Kabushiki Kaisha: *See—*
Kobori, Toshio; and Sahara, Masayoshi, 4,311,371, Cl. 354-34.000.
Seino, Kuniki; and Ozaki, Yoshihiro, 4,311,776, Cl. 430-48.000.
Seino, Kuniki; and Ozaki, Yoshihiro, 4,311,777, Cl. 430-48.000.

Mirrorcraft, Inc.: *See—*
Marsalka, Joseph P.; and Kennedy, John P., 4,311,363, Cl. 350-299.000.

Mita Industrial Company Limited: *See—*
Miyakawa, Nobuhiro; and Teshima, Takashi, 4,311,779, Cl. 430-107.000.

Mitchell, Edward: *See—*
Stana, Regis R.; Mitchell, Edward; Rudolph, Joseph S.; and Lopez, Jose G., 4,311,675, Cl. 423-8.000.

Mitsubishi Chemical Industries, Ltd.: *See—*
Miyazaki, Takane; and Ikeda, Takeshi, 4,311,682, Cl. 423-448.000.
Nitta, Issei; Haruyama, Toshio; and Inoue, Shinya, 4,311,646, Cl. 260-397.400.

Mitsubishi Gas Chemical Company Inc.: *See—*
Kaetsu, Isao; Kumakura, Minoru; Yoshida, Masaru; Shimaoka, Goro; and Urabe, Masanobu, 4,311,732, Cl. 427-164.000.
Takagawa, Makoto; Ueno, Tamotsu; and Takahashi, Takehiko, 4,311,867, Cl. 585-736.000.
Ueno, Tamotsu; Takahashi, Takehiko; Takada, Kazuo; Hidaka, Toshio; and Takagawa, Makoto, 4,311,868, Cl. 585-747.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Imai, Hiroto, 4,311,475, Cl. 493-142.000.

Mitsubishi Petrochemical Co., Ltd.: *See—*
Fujii, Masaki; Miyabayashi, Mitsutaka; Todaka, Hironori; and Ishizaki, Yoshihiro, 4,311,810, Cl. 525-321.000.

Mitsui, Kazuhiko; and Ogawa, Mototugu, to Olympus Optical Co., Ltd. Fluid feeding device for an endoscope. 4,311,134, Cl. 128-6.000.

Mitsui Petrochemical Industries Ltd.: *See—*
Morita, Yoshinori; and Kashiwa, Norio, 4,311,817, Cl. 526-124.000.

Mitsui Toatsu Chemicals, Inc.: *See—*
Inoue, Shigeru; Ono, Hiroshi; Fukui, Akito; and Morikawa, Haruyuki, 4,311,856, Cl. 564-67.000.

Miura, Makoto: *See—*
Tsubaki, Toshio; Tokunaga, Takeshi; Yonekura, Seiji; Matsuoka, Shigeru; Miura, Makoto; and Yamauchi, Kozi, 4,311,225, Cl. 192-142.00R.

Miyabayashi, Mitsutaka: *See—*
Fujii, Masaki; Miyabayashi, Mitsutaka; Todaka, Hironori; and Ishizaki, Yoshihiro, 4,311,810, Cl. 525-321.000.

Miyakawa, Nobuhiro; and Teshima, Takashi, to Mita Industrial Company Limited. Developer for developing electrostatic latent images. 4,311,779, Cl. 430-107.000.

Miyake, Tetsuya; Takeda, Kunihiko; and Ikeda, Akihiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Novel basic cross-linked polymers. 4,311,799, Cl. 521-31.000.

Miyanaka, Motoshi: *See—*
Toudo, Kenzi; Miyanaka, Motoshi; Saeki, Ikuo; and Nakaoka, Yosiaki, 4,311,576, Cl. 204-196.000.

Miyazaki, Takane; and Ikeda, Takeshi, to Mitsubishi Chemical Industries, Ltd. Process for preparing a graphite product. 4,311,682, Cl. 423-448.000.

Mizuguchi, Shinichi: *See—*
Matsumura, Kenichi; Mizuguchi, Shinichi; Onoda, Tadayuki; Hamada, Tsutomu; and Noda, Hisato, 4,311,110, Cl. 118-50.100.

Mizuno Corporation: *See—*
Mizuno, Masato, 4,311,307, Cl. 273-65.00B.

Mizuno, Masato, to Mizuno Corporation. Balls for sports. 4,311,307, Cl. 273-65.00B.

Mo och Domsjo Aktiebolag: *See—*
Hultman, Bengt G.; and Berglund, Erik A., 4,311,666, Cl. 422-62.000.

Mobil Oil Corporation: *See—*
Chen, Nai-Yuen; Miale, Joseph N.; and Reagan, William J., 4,311,865, Cl. 585-640.000.
Givens, Wyatt W., 4,311,912, Cl. 376-109.000.
Masse, Lucien; Medlin, W. Louis; and Sexton, James H., 4,312,049, Cl. 367-35.000.

Mochizuki, Manabu; and Ohno, Yukihiro, to Ricoh Company, Ltd. Electrophotographic process and apparatus of two revolutions/copy, wet developing type. 4,311,780, Cl. 430-125.000.

Mochizuki, Tsutomu: *See—*
Oka, Hideki; Itoga, Keiji; and Mochizuki, Tsutomu, 4,311,715, Cl. 426-46.000.

Modes, Vernon E.; Tam, Hak W.; Quinton, Wayne E.; Bailey, Alan G.; Niskanen, Robert A.; Vitez, Lou; and DeBardi, Gary A., to Quinton Instrument Co. Medical electrode and system for minimizing motion artifacts. 4,311,152, Cl. 128-641.000.

Modine Manufacturing Company: *See—*
Verhaeghe, Robert C.; and Huggins, Homer D., 4,311,193, Cl. 165-149.000.

Modispacher, Donald R.: *See—*
Jeffras, Nathaniel B.; and Modispacher, Donald R., 4,311,052, Cl. 73-634.000.

Moelants, Felix J.: *See—*
Lemahieu, Raymond G.; Moelants, Felix J.; and Ville, Frans J., 4,311,787, Cl. 430-522.000.

Moerk, John C., Jr.: *See—*
Czernik, Daniel E.; and Moerk, John C., Jr., 4,311,318, Cl. 277-235.00B.

Molex Incorporated: *See—*
Funcik, Jack F.; Bennet, Joseph C.; Tubbs, Joseph T.; and Schneider, Thomas E., 4,310,967, Cl. 29-749.000.

Molins Limited: *See—*
Bennett, George, 4,311,229, Cl. 198-457.000.

Mollison, Alistair N.; and Zboril, Vaclay G., to Du Pont de Nemours, E. I., and Company. Process for the preparation of polymers of α-olefins. 4,311,816, Cl. 526-116.000.

Moltner, Hermann: *See—*
Demny, Werner; and Moltner, Hermann, 4,311,033, Cl. 72-224.000.

Moltrasio, Mario. Automatic feeder for empty bags or the like. 4,311,228, Cl. 198-422.000.

Moniot, Jerome L.; Fox, Rita T.; Sprague, Peter W.; and Haslanger, Martin F., to E. R. Squibb & Sons, Inc. Method for preparing 10,10-difluoro prostacyclin intermediates and new compounds produced thereby. 4,311,644, Cl. 260-346.220.

Monsanto Company: *See—*
Abdou-Sabet, Sabet; and Fath, Michael A., 4,311,628, Cl. 260-33.6AQ.
Bollinger, Frederic G., 4,311,572, Cl. 204-158.00R.
Chupp, John P., 4,311,858, Cl. 564-214.000.
Dufour, Daniel L., 4,311,806, Cl. 525-71.000.
Morita, Eiichi, 4,311,648, Cl. 260-453.0RW.
Perry, Eli, 4,311,594, Cl. 210-640.000.
Wolfinger, Mark D., 4,311,813, Cl. 525-348.000.

Montealegre, James, to Champion International Corporation. Multi-cell divider carton. 4,311,269, Cl. 229-28.00R.

Montedison S.p.A.: *See—*
Gozzo, Franco; Abbruzzese, Luigi; and Siddi, Giorgio, 4,311,516, Cl. 71-111.000.

Montminy, Joseph G. B.; and Chevrette, Paul C., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Automatic MRT system. 4,312,015, Cl. 358-139.000.

Mookherjee, Braja D.: *See—*
Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,311,754, Cl. 428-284.000.

Moore, Edward L. Gutter cleaner. 4,310,940, Cl. 15-105.000.

Moore, William S.: *See—*
Chiang, John S. C.; and Moore, William S., 4,311,681, Cl. 423-321.00S.

Moorhouse, David, to UOP Inc. Armrest assembly for a seat. 4,311,338, Cl. 297-411.000.

Mooty, Donald J.: *See—*
Landt, Harvey L.; and Mooty, Donald J., 4,311,972, Cl. 333-17.00M.

Moretti, Giovanni, to Ballestia Chimica, S.p.A. Multi-stage neutralization of sulfated compounds. 4,311,650, Cl. 260-458.00R.

Mori, Hiroshi: *See—*
Fukuda, Hiroaki; Sasaki, Takehiko; and Mori, Hiroshi, 4,311,953, Cl. 320-2.000.

Mori, Ikuo, to Nippon Kogaku K.K. Wide angle photographic lens. 4,311,367, Cl. 350-461.000.

Morichika, Katsuyuki: *See—*
Banba, Tosio; Morichika, Katsuyuki; and Nakanishi, Tetsuya, 4,311,122, Cl. 123-279.000.

Morikawa, Haruyuki: *See—*
Inoue, Shigeru; Ono, Hiroshi; Fukui, Akito; and Morikawa, Haruyuki, 4,311,856, Cl. 564-67.000.

Morin, LeRoy D. Rod and reel caddy. 4,311,262, Cl. 294-141.000.

Morinaga, Akio: *See—*
Ohtsuga, Hisao; Morinaga, Akio; and Morita, Akira, 4,311,548, Cl. 156-287.000.

Morita, Akira: *See—*
Ohtsuga, Hisao; Morinaga, Akio; and Morita, Akira, 4,311,548, Cl. 156-287.000.

Morita, Eiichi, to Monsanto Company. N-(Sulfenyl) methacrylamides. 4,311,648, Cl. 260-453.0RW.

Morita, Yoshinori; and Kashiwa, Norio, to Mitsui Petrochemical Industries Ltd. Process for polymerizing olefins and catalyst therefor. 4,311,817, Cl. 526-124.000.

Moritani, Tohei; Yamauchi, Junnosuke; and Shiraishi, Makoto, to Kuraray Company, Limited. Vinyl alcohol copolymers containing cationic groups. 4,311,805, Cl. 525-60.000.

Morito, Nobuyuki, to Kawasaki Steel Corporation. Method of sealing an inner cover arranged in a box annealing furnace used for producing grain-oriented silicon steel sheets. 4,311,538, Cl. 148-112.000.

Moriya, Kiyoshi: *See—*
Sasaki, Yutaka; Moriya, Kiyoshi; and Nakamura, Yoshimi, 4,311,611, Cl. 252-412.000.

Morse, John B.: *See—*
Johnson, Bruce K.; and Morse, John B., 4,311,374, Cl. 354-144.000.

Motion Control, Inc.: *See—*
La Passo, Leonard J.; and Benoit, Harry, 4,311,049, Cl. 73-362.400.

Motomura, Reiji; Ohta, Hirofumi; Matsuura, Takashi; and Itaya, Kou, to Hoya Corporation. Camera filters and a method of making the same. 4,311,364, Cl. 350-318.000.

Motorola, Inc.: *See—*
Coombes, Daniel J.; and Seitz, Martin V., 4,312,070, Cl. 371-40.000.
Donoghue, William J., 4,312,047, Cl. 365-189.000.
Gay, Michael J., 4,311,873, Cl. 179-1.00D.
Gunter, Thomas G.; Hobbs, Colleen M. E.; Spak, Michael E.; and Tredennick, Harry L., 4,312,034, Cl. 364-200.000.
Kelley, Stephen H.; and Ulmer, Richard W., 4,311,988, Cl. 340-347.0DA.
Pautler, James A.; and Felix, Kenneth A., 4,312,074, Cl. 375-96.000.

Moxham Industrial Pty., Ltd.: *See—*
Wood, Kenneth H., 4,311,217, Cl. 188-65.200.

MTU Motoren-und Turbinen-Union Munchen GmbH: *See—*
Vedova, Ralph; and Jabs, Alfred, 4,311,313, Cl. 277-27.000.

Muelier, Jean-Pierre; and Raemy, Marius, to Breveteam S.A. Method for manufacturing a strip-shaped composite body. 4,311,542, Cl. 156-84.000.

Mugrauer, Hubert, to Siemens Aktiengesellschaft. Method of vapor fixing a toner. 4,311,723, Cl. 427-14.100.

Muller, Maurice E., to Gebruder Sulzer A.G.; and Protek A.G. Hip joint prosthesis. 4,310,931, Cl. 3-1.913.

Mullins, Albert A., II, to Baker International Corporation. Hydraulically set well packer. 4,311,195, Cl. 166-120.000.

Mullins, Albert A., II: *See—*
Beall, Clifford H.; and Mullins, Albert A., II, 4,311,196, Cl. 166-134.000.

Mulvey, Robert F.; and Crepeau, Charles E., to General Electric Co. Cement reinforced gypsum foam with mineral wool. 4,310,996, Cl. 52-809.000.

Munck, Lars: *See—*
Gibbons, Gregory C.; and Munck, Lars, 4,311,358, Cl. 350-91.000.

Murakami, Naoyuki. Phase control device which compensates for input variations. 4,311,955, Cl. 323-300.000.

Murakami, Ryoichi: *See—*
Yasuhara, Kiyotada; Takahashi, Masashi; Murakami, Ryoichi; and Senzaki, Takashi, 4,311,535, Cl. 148-6.15Z.

Murakami, Takayuki: *See—*
Abe, Sigeharu; Tamura, Hideo; and Murakami, Takayuki, 4,311,546, Cl. 156-643.000.

Murakami, Takeshi: *See—*
Oeda, Yoshitaka; Murakami, Takeshi; Hayashi, Hiroo; and Nakamura, Teruo, 4,311,758, Cl. 428-341.000.

Murakami, Yukiyasu: *See—*
Koda, Akio; Isaka, Ichiro; and Murakami, Yukiyasu, 4,311,842, Cl. 544-27.000.

Murano, Kazuo; Unagami, Shigeyuki; Itoh, Yoshikazu; Amano, Fumio; and Hayashi, Tatsuki, to Fujitsu Limited. Timing-phase recovery circuit. 4,312,075, Cl. 375-106.000.

Murphy, Richard J., to Boeing Company, The. Method and apparatus for the automated assembly of major subassemblies. 4,310,964, Cl. 29-469.000.

Murphy, William J.: *See—*
Hencey, Thomas R., Jr.; and Murphy, William J., 4,311,917, Cl. 290-1.00A.

Murtha, Timothy P.; and Drake, Charles A., to Phillips Petroleum Company. Catalytic hydrogenation of unsaturated dinitriles. 4,311,859, Cl. 564-491.000.

Myers, Marion M.; and Tellefsen, William J., to Delta Oil Products Corporation. Low emission foundry binder system. 4,311,631, Cl. 260-38.000.

N. V. Klippan S.A.: *See—*
Robben, Paul J.; and De Vuyst, Hugo R., 4,310,952, Cl. 24-230.00A.

Naarmann, Herbert: *See—*
Hahn, Klaus; Himmele, Walter; Naarmann, Herbert; and Penzien, Klaus, 4,311,636, Cl. 260-45.80N.

Nabeta, Teiichi: *See—*
Kojima, Yasuhumi; Nabeta, Teiichi; and Otuka, Fumio, 4,311,188, Cl. 165-2.000.

Nader, Max; and Glabiszewski, Richard. Artificial knee-joint. 4,310,932, Cl. 3-28.000.

Nagabhushan, Tattanahalli L., to Schering Corporation. 1-Aryl-2-acylamido-3-fluoro-1-propanol acylates, methods for their manufacture and intermediates useful therein, methods for their use as antibacterial agents and compositions useful therefor. 4,311,857, Cl. 564-212.000.

Nagano Miso Kabushiki Kaisha: *See—*
Oka, Hideki; Itoga, Keiji; and Mochizuki, Tsutomu, 4,311,715, Cl. 426-46.000.

Nagira, Norichika: *See—*
Kitashima, Satoyuki; and Nagira, Norichika, 4,311,030, Cl. 72-8.000.

Nail, George R., to Public Service Company of New Mexico. Transfer logic control circuitry. 4,311,919, Cl. 307-64.000.

Najer, Henry: *See—*
Manoury, Philippe M. J.; Cavero, Icilio A. G.; Najer, Henry; and Giudicelli, Don P. R. L., 4,311,708, Cl. 424-330.000.

Nakaguchi, Osamu: *See—*
Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Imanaka, Hiroshi; Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; and Hashimoto, Masashi, 4,311,640, Cl. 260-112.50R.

Nakajima, Kouichi: *See—*
Tsuchiya, Hidetaka; and Nakajima, Kouichi, 4,311,893, Cl. 200-340.000.

Nakajiri, Takashi, to Sharp Kabushiki Kaisha. Demodulator in a facsimile system. 4,312,018, Cl. 358-261.000.

Nakamura, Isamu: *See—*
Yasui, Tadashi; Nakamura, Isamu; and Goto, Shigeo, 4,311,505, Cl. 65-43.000.

Nakamura, Tadashi; and Kiyozumi, Kentaro, to Ise Electronics Corporation. Hand held type electronic calculators. 4,311,996, Cl. 340-711.000.

Nakamura, Teruo: *See—*
Oeda, Yoshitaka; Murakami, Takeshi; Hayashi, Hiroo; and Nakamura, Teruo, 4,311,758, Cl. 428-341.000.

Nakamura, Yoshikatsu, to Nippon Piston Ring Co., Ltd. Sliding member for use in internal combustion engine. 4,311,525, Cl. 75-240.000.

Nakamura, Yoshimi: *See—*
Sasaki, Yutaka; Moriya, Kiyoshi; and Nakamura, Yoshimi, 4,311,611, Cl. 252-412.000.

Nakanishi, Tetsuya: *See—*
Banba, Tosio; Morichika, Katsuyuki; and Nakanishi, Tetsuya, 4,311,122, Cl. 123-279.000.

Nakano, Toshio: *See—*
Kaneko, Tadao; Hashimoto, Michiaki; Nakano, Toshio; and Sasano, Akira, 4,311,773, Cl. 430-7.000.

Nakaoka, Yosiaki: *See—*
Toudo, Kenzi; Miyanaka, Motoshi; Saeki, Ikuo; and Nakaoka, Yosiaki, 4,311,576, Cl. 204-196.000.

Nakauchi, Hiroshi: *See—*
Uede, Hisashi; Inami, Yasuhiko; Hamada, Hiroshi; Hishida, Tadanori; and Nakauchi, Hiroshi, 4,312,000, Cl. 340-785.000.

Nakayama, Wataru: *See—*
Fujioka, Kazumasa; and Nakayama, Wataru, 4,311,931, Cl. 310-55.000.

Nalco Chemical Company: *See—*
Slovinsky, Manuel, 4,311,599, Cl. 210-757.000.

Namikoshi, Hajime; and Notsu, Kazuo, to Daicel Chemical Industries Ltd. Process for preparing ethylcarboxymethylcellulose. 4,311,833, Cl. 536-90.000.
Nanasi, John. Jewelry clasp. 4,310,953, Cl. 24-230.0AL.
Naqvi, Zargham H. Controller for maintaining a constant temperature of discharged liquid. 4,311,271, Cl. 236-12.00R.
Narumi, Tadataka; and Sato, Akihiko, to Toyoda Koki Kabushiki Kaisha. Valve system in power steering systems. 4,311,161, Cl. 137-117.000.
National Distillers & Chemical Corp.: *See*—
Braus, Harry, 4,311,825, Cl. 528-232.000.
National Gypsum Company: *See*—
Kennedy, Arthur E., 4,311,767, Cl. 428-537.000.
National Institute of Radiological Sciences: *See*—
Takami, Katsumi; Ito, Yoshitoshi; Ishimatsu, Kenji; and Tanaka, Eiichi, 4,311,907, Cl. 250-368.000.
National Pen Corporation: *See*—
Liguori, Tom, 4,311,403, Cl. 401-209.000.
National Research Development Corporation: *See*—
Brown, Joseph E.; Gamble, Charles R.; and Norman, Frank, 4,311,948, Cl. 318-759.000.
Holland, Leslie, 4,311,725, Cl. 427-10.000.
Leonard, Ian C. A., 4,311,080, Cl. 87-44.000.
National Tax Administration Agency: *See*—
Yoshizawa, Kiyoshi; Nojiro, Kikuo; Itoh, Masamitsu; Kiuchi, Hiroshi; and Horii, Kazuo, 4,311,721, Cl. 426-623.000.
National Union Electric Corporation: *See*—
Schaefer, Harold W.; Thomas, Joyce K.; and Hohulin, Samuel E., 4,311,493, Cl. 55-369.000.
Natural Energy Systems: *See*—
Rice, Warren, 4,311,025, Cl. 62-502.000.
Nave, William E., to Bendix Corporation, The. Flexural pivot member. 4,311,303, Cl. 267-160.000.
Neal, W. Harold. Mobile apparatus for spraying protective coatings. 4,311,274, Cl. 239-1.000.
Neary, Michael P.; and Wilson, Thomas A. Solar collector with dark solution. 4,311,603, Cl. 252-70.000.
Nebe, Rainer: *See*—
Auerbach, Horst; Nebe, Rainer; and Supp, Armin, 4,311,240, Cl. 209-169.000.
Nelson, Eric L., to Nelson Research & Development Company. Method for improved dyeing. 4,311,481, Cl. 8-564.000.
Nelson Research & Development Company: *See*—
Nelson, Eric L., 4,311,481, Cl. 8-564.000.
Nelson, Robert A.: *See*—
Bantz, David F.; Evangelisti, Carlo J.; and Nelson, Robert A., 4,312,066, Cl. 371-16.000.
Neomed, Inc.: *See*—
Esty, Janet M.; and Cox, John A., 4,311,145, Cl. 128-303.170.
Nessi, Aurindo, to Innocenti Santeustacchio S.p.A. Method and apparatus for rolling seamless tubes with a restrained mandrel. 4,311,032, Cl. 72-208.000.
Nettesheim, Daniel R.; and Guyer, Robert R., to Schwaab, Inc. Method and apparatus for producing printing patterns. 4,311,381, Cl. 355-100.000.
Neuenschwander, Rudolf: *See*—
Gotchel, Joel P.; and Neuenschwander, Rudolf, 4,311,037, Cl. 73-38.000.
New Nippon Electric Company, Ltd.: *See*—
Tanida, Takeyoshi, 4,311,056, Cl. 74-10.850.
Newell, Dennis E., to Robertshaw Controls Company. Method and apparatus for heat pump system protection. 4,311,497, Cl. 62-158.000.
Nicoll, Frank D., to Tenneco Chemicals, Inc. Manufacture of continuous plastic sheets. 4,311,658, Cl. 264-175.000.
Niemann, Hans-Joachim: *See*—
Janner, Karl; Gregorius, Klaus; Niemann, Hans-Joachim; Kersting, Arno; and Schuster, Eberhard, 4,311,674, Cl. 423-3.000.
Nieminen, Jorma J.; and Engstrom Folke, to A. Ahlstrom Osakeyhtio. Fluidized bed reactor system. 4,311,670, Cl. 422-145.000.
Nigrin, Jaroslava M., to Corning Glass Works. Method of coating glass or ceramics with a colored frit. 4,311,504, Cl. 65-32.000.
Nikles, Erwin, to Ciba-Geigy Corporation. Homopolymers and copolymers of vinyl ethers of polyalkylpiperidinols and their use as stabilizers for plastics. 4,311,820, Cl. 526-265.000.
Nippon Columbia Kabushikikaisha: *See*—
Hayashi, Hideaki, 4,312,061, Cl. 369-216.000.
Nippon Crucible Co., Ltd.: *See*—
Okada, Tamio; and Sano, Toshiaki, 4,311,301, Cl. 266-196.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Baba, Michiru, 4,312,044, Cl. 364-554.000.
Nippon Kogaku K.K.: *See*—
Mori, Ikuo, 4,311,367, Cl. 350-461.000.
Okada, Masashi; Akiyama, Yuji; Kawada, Takaharu; and Kawahara, Atsushi, 4,311,904, Cl. 250-204.000.
Nippon Piston Ring Co., Ltd.: *See*—
Nakamura, Yoshikatsu, 4,311,525, Cl. 75-240.000.
Nippon Steel Corporation: *See*—
Kitashima, Satoyuki; and Nagira, Norichika, 4,311,030, Cl. 72-8.000.
Nippondenso Co., Ltd.: *See*—
Hiraiwa, Takashi; and Fujita, Yuichi, 4,311,749, Cl. 428-209.000.
Kojima, Yasuhumi; Nabeta, Teiichi; and Otuka, Fumio, 4,311,188, Cl. 165-2.000.
Nishimura, Katsuo, to Citizen Watch Company Limited. Composite display type electronic timepiece. 4,312,056, Cl. 368-62.000.
Nishina, Yasuhide: *See*—
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, 4,311,828, Cl. 528-483.000.
Nishioka, Akira: *See*—
Hirata, Hitoshi; and Nishioka, Akira, 4,311,928, Cl. 307-498.000.
Nishioka, Masao: *See*—
Kato, Heizaburo; Ogawa, Yoshio; and Nishioka, Masao, 4,311,224, Cl. 192-56.00R.
Nishizawa, Yoshihiko; Furukawa, Toshio; Goto, Teruo; and Onishi, Hirotsugu, to Kikkoman Corporation. Process for producing a filler for adhesive for bonding wood. 4,311,621, Cl. 260-17.200.
Niskanen, Robert A.: *See*—
Modes, Vernon E.; Tam, Hak W.; Quinton, Wayne E.; Bailey, Alan G.; Niskanen, Robert A.; Vitez, Lou; and DeBardi, Gary A., 4,311,152, Cl. 128-641.000.
Nissan Jidosha Kabushiki Kaisha: *See*—
Okada, Shigeo; and Sato, Katsuo, 4,311,421, Cl. 411-59.000.
Nissan Motor Company, Ltd.: *See*—
Endo, Hiroshi; Baba, Kousaku; and Matsumura, Akira, 4,311,876, Cl. 179-15.5ST.
Hamada, Hideo; and Suga, Masaaki, 4,311,062, Cl. 74-333.000.
Hosoya, Katsumi; and Kadowaki, Shunichi, 4,311,042, Cl. 73-118.000.
Kakizaki, Tadao; Utsugi, Akira; Hibino, Masahiro; and Otsubo, Kizuku, 4,311,129, Cl. 123-588.000.
Sukeshita, Kazumi, 4,311,064, Cl. 74-473.00R.
Tsuda, Hiroshi; and Adachi, Masahiro, 4,311,365, Cl. 350-399.000.
Nita, Jozef: *See*—
Kajdas, Czeslaw; Nita, Jozef; and Krawczyk, Krzysztof, 4,311,036, Cl. 73-10.000.
Nitta, Issei; Haruyama, Toshio; and Inoue, Shinya, to Mitsubishi Chemical Industries Limited. Process for the preparation of 4,6-dien-3-one steroids. 4,311,646, Cl. 260-397.400.
Nitto Chemical Industry, Co., Ltd.: *See*—
Sasaki, Yutaka; Moriya, Kiyoshi; and Nakamura, Yoshimi, 4,311,611, Cl. 252-412.000.
Noble, Robert T., to Texas Instruments Incorporated. Electronic timepiece circuits. 4,312,055, Cl. 368-29.000.
Noda, Hisato: *See*—
Matsumura, Kenichi; Mizuguchi, Shinichi; Onoda, Tadayuki; Hamada, Tsutomu; and Noda, Hisato, 4,311,110, Cl. 118-50.100.
Nojiro, Kikuo: *See*—
Yoshizawa, Kiyoshi; Nojiro, Kikuo; Itoh, Masamitsu; Kiuchi, Hiroshi; and Horii, Kazuo, 4,311,721, Cl. 426-623.000.
Nomura, Hirokazu: *See*—
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, 4,311,828, Cl. 528-483.000.
Noose, Theodore. Flue device. 4,311,130, Cl. 126-25.00B.
Noren, Gerry K., to DeSoto, Inc. Curable organosilicate coating compositions containing 1,3-oxazolidine curing agent. 4,311,827, Cl. 528-405.000.
Norlin Industries, Inc.: *See*—
Hall, Robert J., 4,311,077, Cl. 84-1.030.
Norman, Frank: *See*—
Brown, Joseph E.; Gamble, Charles R.; and Norman, Frank, 4,311,948, Cl. 318-759.000.
Norman, Robert W., Jr.: *See*—
Porter, Marion G.; and Norman, Robert W., Jr., 4,312,036, Cl. 364-200.000.
North American Philips Corporation: *See*—
Riggs, William D.; and Schegan, Joseph J., 4,311,933, Cl. 310-156.000.
Norton-Berry, Philip: *See*—
Cowen, Geoffrey; Norton-Berry, Philip; and Steel, Margaret L., 4,311,570, Cl. 204-157.10R.
Norton Company: *See*—
Kressner, Bernhardt E., 4,311,489, Cl. 51-298.000.
Nose, Yukihiko; and Malchesky, Paul S., to Japan Foundation for Artificial Organs. Filter arrangement denying bacteria entry to peritoneum. 4,311,587, Cl. 210-136.000.
Notman, Alan, to Imperial Chemical Industries Limited. Synthesis reactor. 4,311,671, Cl. 422-148.000.
Notsu, Kazuo: *See*—
Namikoshi, Hajime; and Notsu, Kazuo, 4,311,833, Cl. 536-90.000.
Notte, Angelo J.: *See*—
Hold, Peter; Notte, Angelo J.; and Rizzi, Marc A., 4,311,446, Cl. 425-144.000.
Nuding, Erich; and Hirsch, Gerhard, to Licentia Patent-Verwaltungs GmbH. Waveguide junction. 4,311,973, Cl. 333-33.000.
Nylen, Ulf T. G.; and Qvarnstrom, Lars A. G., to Gambro AG. Method for sampling and measuring the content of a low-molecular weight compound in a complex fluid medium. 4,311,789, Cl. 435-10.000.
O'Brien, John P. Elastic cord suspended golf practice pad. 4,311,312, Cl. 273-195.00A.
Ochoa, Enrique J., to Jewelmasters, Inc. Composite finger ring and method of making same. 4,311,026, Cl. 63-15.000.
Ochsenbein, Michel; and Ollivier, Jean-Paul, to Produits Chimiques Ugine Kuhlmann. Unsaturated polyester resin and process. 4,311,814, Cl. 525-438.000.
Odell, Jeffrey A.: *See*—
Barham, Peter J.; Odell, Jeffrey A.; and Willmouth, Frank M., 4,311,660, Cl. 264-342.0RE.
Odstrchel, Gerald: *See*—
Hertl, William; and Odstrchel, Gerald, 4,311,687, Cl. 424-1.000.

Oeda, Yoshitaka; Murakami, Takeshi; Hayashi, Hiroo; and Nakamura, Teruo, to Kanzaki Paper Manufacturing Co., Ltd. Heat-sensitive record material. 4,311,758, Cl. 428-341.000.

Ogawa, Mikio, to Western Stamping Corporation. Cash register mechanism. 4,311,901, Cl. 235-12.000.

Ogawa, Mototugu: *See—*
Mitsui, Kazuhiko; and Ogawa, Mototugu, 4,311,134, Cl. 128-6.000.

Ogawa, Yoshio: *See—*
Kato, Heizaburo; Ogawa, Yoshio; and Nishioka, Masao, 4,311,224, Cl. 192-56.00R.

Ogi, Koei: *See—*
Hayakawa, Masatoshi; and Ogi, Koei, 4,311,457, Cl. 432-222.000.

Ohloff, Gunther: *See—*
Skorianetz, Werner; and Ohloff, Gunther, 4,311,852, Cl. 560-256.000.

Ohno, Yukihiro: *See—*
Mochizuki, Manabu; and Ohno, Yukihiro, 4,311,780, Cl. 430-125.000.

Ohta, Hirofumi: *See—*
Motomura, Reiji; Ohta, Hirofumi; Matsuura, Takashi; and Itaya, Kou, 4,311,364, Cl. 350-318.000.

Ohtsubo, Junji, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for determination of velocity and direction of motion of moving object by speckle patterns and apparatus therefor. 4,311,383, Cl. 356-28.500.

Ohtsuga, Hisao; Morinaga, Akio; and Morita, Akira, to Ashimori Industry Co., Ltd. Method for providing the inner surface of a pipe with a flexible tubular lining material through a liquid resin under pressure. 4,311,548, Cl. 156-287.000.

Oka, Hideki; Itoga, Keiji; and Mochizuki, Tsutomu, to Nagano Miso Kabushiki Kaisha. Method of preparing albumin rich foodstuff raw materials. 4,311,715, Cl. 426-46.000.

Okada, Masashi; Akiyama, Yuji; Kawada, Takaharu; and Kawahara, Atsushi, to Nippon Kogaku K.K. Automatic focus adjusting device. 4,311,904, Cl. 250-204.000.

Okada, Satoshi: *See—*
Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Imanaka, Hiroshi; Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; and Hashimoto, Masashi, 4,311,640, Cl. 260-112.50R.

Okada, Shigeo; and Sato, Katsuo, to Kato Hatsujou Kabushiki Kaisha; and Nissan Jidosha Kabushiki Kaisha. Fastener. 4,311,421, Cl. 411-59.000.

Okada, Tamio; and Sano, Toshiaki, to Nippon Crucible Co., Ltd. Guide trough for molten products. 4,311,301, Cl. 266-196.000.

Okouchi, Isao: *See—*
Matsuzaki, Harumi; Kuroda, Osamu; Okouchi, Isao; Izumi, Kenkichi; and Takahashi, Sankichi, 4,311,575, Cl. 204-180.00P.

Olin Corporation: *See—*
Kircher, Morton S., 4,311,577, Cl. 204-255.000.

Oliver, Jean E.: *See—*
Evans, John R.; Fildes, Francis J. T.; and Oliver, Jean E., 4,311,712, Cl. 424-365.000.

Ollivier, Jean-Marie: *See—*
Braye, Emile H.; and Ollivier, Jean-Marie, 4,311,845, Cl. 546-114.000.

Ollivier, Jean-Paul: *See—*
Ochsenbein, Michel; and Ollivier, Jean-Paul, 4,311,814, Cl. 525-438.000.

Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; Ernst, Horst M.; and Schido, Friedrich, to SKF Kugellagerfabriken GmbH. Linear motion ball bearings. 4,311,348, Cl. 308-6.00C.

Olson, Raymond N., to Sundstrand Corporation. Liquid cooling for induction motors. 4,311,932, Cl. 310-61.000.

Olympia Werke Ag: *See—*
Gerjets, Heinz, 4,311,398, Cl. 400-70.000.

Olympus Optical Company Limited: *See—*
Gocho, Nagahiro, 4,311,667, Cl. 422-64.000.
Kimura, Kenji, 4,312,019, Cl. 360-22.000.
Komiya, Osamu, 4,311,143, Cl. 128-303.150.
Manabe, Sugio, 4,311,394, Cl. 356-440.000.
Matsuura, Tsuyoshi, 4,311,375, Cl. 354-60.00R.
Mitsui, Kazuhiko; and Ogawa, Mototugu, 4,311,134, Cl. 128-6.000.

Omae, Tsutomu: *See—*
Iwamoto, Taro; Ando, Shimon; Kusumoto, Sho; Omae, Tsutomu; Suzuki, Toshitaka; Takidera, Masatake; Koyama, Takaichi; Hamada, Kunio; and Yoshida, Kazuhiro, 4,311,556, Cl. 376-249.000.

Omeco-St. John Co.: *See—*
Bailen, Eddie H., 4,312,022, Cl. 361-46.000.

Ona, Isao; Ozaki, Masaru; and Usui, Katsutoshi, to Toray Silicone Company, Ltd. Silicone compositions for the treatment of fibers. 4,311,626, Cl. 260-29.20M.

Oncor Corporation: *See—*
Clark, Wallace; and Goldstein, Albert S., Jr., 4,311,443, Cl. 418-48.000.

Ondetti, Miguel A.; and Condon, Michael E., to E. R. Squibb & Sons, Inc. Carboxyalkanoyl and hydroxycarbamoylalkanoyl derivatives of substituted prolines. 4,311,705, Cl. 424-274.000.

Ong, Helen H.: *See—*
Martin, Lawrence L.; Ong, Helen H.; Anderson, Vernon B.; and Crichlow, Charles A., 4,311,703, Cl. 424-263.000.

Onishi, Hirotsugu: *See—*
Nishizawa, Yoshihiko; Furukawa, Toshio; Goto, Teruo; and Onishi, Hirotsugu, 4,311,621, Cl. 260-17.200.

Ono, Hiroshi: *See—*
Inoue, Shigeru; Ono, Hiroshi; Fukui, Akito; and Morikawa, Haruyuki, 4,311,856, Cl. 564-67.000.

Onoda, Tadayuki: *See—*
Matsumura, Kenichi; Mizuguchi, Shinichi; Onoda, Tadayuki; Hamada, Tsutomu; and Noda, Hisato, 4,311,110, Cl. 118-50.100.

Onoue, Toshikatsu, to Sanny Industry Co., Ltd. Rotary blade for pruning machines. 4,310,999, Cl. 56-295.000.

Ookoshi, Isao: *See—*
Takagi, Masatomo; Hagawa, Takanori; Takamatsu, Seietsu; and Ookoshi, Isao, 4,311,887, Cl. 200-42.00T.

Opavsky, Werner; Reisner, Josef; and Maier, Alois, to Wacker-Chemie GmbH. Process for the isolation of monochloroacetaldehyde. 4,311,563, Cl. 203-46.000.

Opitz, Gunter: *See—*
Riessland, Eberhard; Wagner, Wolfgang; and Opitz, Gunter, 4,311,959, Cl. 324-61.00P.

Optical Techniques International, Inc.: *See—*
Burke, Greg M., 4,311,990, Cl. 340-365.00P.

Optimetrix Corporation: *See—*
Phillips, Edward H., 4,311,390, Cl. 356-358.000.

Organisation Europeenne de Recherches Spatiales: *See—*
Capel, Antoine, 4,311,954, Cl. 323-222.000.

Orgler, Helmut: *See—*
Brunner, Hans-Peter; Caldor, Thomas; and Orgler, Helmut, 4,311,871, Cl. 174-74.00A.

Ortloff, John E.; Stelzer, Clarence F., Jr.; and Hayes, Donald R., to Exxon Production Research Company. Universal joint for multiple flowline system. 4,311,327, Cl. 285-136.000.

Oswald, Gerald L., to Atlas Powder Company. Electronic blasting cap. 4,311,096, Cl. 102-202.130.

Otawa, Shuji: *See—*
Ueda, Makoto; Torisawa, Akira; Otawa, Shuji; Mandai, Masaaki; Shida, Masaharu; and Sato, Katsuhiko, 4,311,947, Cl. 318-696.000.

Otis Engineering Corporation: *See—*
White, Pat M., 4,311,194, Cl. 166-120.000.

Otrepiev, Vladimir A.: *See—*
Pimenov, Anatoly N.; Putlyaev, Ivan E.; Otrepiev, Vladimir A.; Guzeev, Evgeny A.; Shesterkina, Natalya F.; Paturoev, Vasily V.; and Pankovsky, Dmitry A., 4,311,530, Cl. 106-84.000.

Otsubo, Kizuku: *See—*
Kakizaki, Tadao; Utsugi, Akira; Hibino, Masahiro; and Otsubo, Kizuku, 4,311,129, Cl. 123-588.000.

Otsuka, Yoshiaki, to Toyo Seikan Kaisha, Ltd. Retort-sterilizable laminated pouch comprising a flexible gas-barrier substrate and blended crystalline olefin layer. 4,311,742, Cl. 428-35.000.

Otuka, Fumio: *See—*
Kojima, Yasuhumi; Nabeta, Teiichi; and Otuka, Fumio, 4,311,188, Cl. 165-2.000.

Oude Alink, Bernardus A.: *See—*
Thompson, Neil E. S.; and Oude Alink, Bernardus A., 4,311,841, Cl. 544-231.000.

Outboard Marine Corporation: *See—*
Blanchard, Clarence E., 4,311,470, Cl. 440-6.000.

Owen, Kenneth, to Continental Electronics Mfg. Co. Output transformer. 4,311,977, Cl. 336-69.000.

Owens-Corning Fiberglas Corporation: *See—*
Eisenberg, Arnold J.; Greene, Neil E.; and Glaser, Hellmut I., 4,311,499, Cl. 65-1.000.
Propster, Mark A., 4,311,502, Cl. 65-27.000.
Roberson, Cletis L.; and Langlois, Roland E., 4,311,500, Cl. 65-2.000.

Ozaki, Masaru: *See—*
Ona, Isao; Ozaki, Masaru; and Usui, Katsutoshi, 4,311,626, Cl. 260-29.20M.

Ozaki, Sozaburo; and Tonooka, Isao, to Hitachi, Ltd. Brush holding device for electric motor. 4,311,936, Cl. 310-242.000.

Ozaki, Yoshihiro: *See—*
Seino, Kuniki; and Ozaki, Yoshihiro, 4,311,776, Cl. 430-48.000.
Seino, Kuniki; and Ozaki, Yoshihiro, 4,311,777, Cl. 430-48.000.

Ozamiz, Juan M.: *See—*
Hewitt, Sidney J.; Ozamiz, Juan M.; and Yallup, Albert E., 4,311,957, Cl. 324-58.50R.

Paglione, Robert W.: *See—*
Sterzer, Fred; and Paglione, Robert W., 4,311,154, Cl. 128-804.000.

Palar (Curacao) N.V.: *See—*
Hoyss, Franz, 4,311,935, Cl. 310-227.000.

Palma, Victor J., to American Motors Corporation-Jeep. Vehicle window cleaning system. 4,310,943, Cl. 15-250.010.

Palmer, Raymond J., to McDonnell Douglas Corporation. Resin impregnation process. 4,311,661, Cl. 264-510.000.

Pandya, Punit J.: *See—*
Chang, Albert Y.; and Pandya, Punit J., 4,311,925, Cl. 307-455.000.

Panicci, Richard L., to Kiddie Products, Inc. Beaded teething ring, closure latch. 4,311,149, Cl. 128-359.000.

Pankovsky, Dmitry A.: *See—*
Pimenov, Anatoly N.; Putlyaev, Ivan E.; Otrepiev, Vladimir A.; Guzeev, Evgeny A.; Shesterkina, Natalya F.; Paturoev, Vasily V.; and Pankovsky, Dmitry A., 4,311,530, Cl. 106-84.000.

Pantasote Inc.: *See—*
Pearson, Stanley, 4,311,635, Cl. 260-42.490.

Paret, Jacques: *See—*
Dameret, Jean-Louis; Maximilien, Jacques; and Paret, Jacques, 4,311,155, Cl. 131-280.000.

Parker, Kenneth O., to Garrett Corporation, The. Method of fabrication of a formed plate, counterflow fluid heat exchanger and apparatus thereof. 4,310,960, Cl. 29-157.30R.

Pascal, Robert A.: *See—*
Herbst, Walter; and Pascal, Robert A., 4,311,183, Cl. 160-37.000.

Passemard, Jean R.: *See—*
Balaud, Daniel; Keledjian, Gaston; and Passemard, Jean R., 4,310,958, Cl. 29-26.00A.

Patel, Arvind M.: *See—*
Frank, Howard; Swafford, John W., Jr.; Farazi, Perry; Patel, Arvind M.; Chan, Cheuk-Wah; Dohnal, Edward J.; Wang, Clark S.; and Mehta, Ashokkumar D., 4,312,043, Cl. 364-551.000.

Patel, Lalit; and Cooperman, Michael, to GTE Laboratories Incorporated. Emitter coupled logic programmable logic arrays. 4,311,926, Cl. 307-466.000.

Pathmann, Charles E., to Lake Center Industries. Actuator with electric feedback signal. 4,311,946, Cl. 318-663.000.

Patlico Rights N.V.: *See—*
van Kuijk, Josephus P. M., 4,311,132, Cl. 126-438.000.

Paturoev, Vasily V.: *See—*
Pimenov, Anatoly N.; Putlyaev, Ivan E.; Otrepiev, Vladimir A.; Guzeev, Evgeny A.; Shesterkina, Natalya F.; Paturoev, Vasily V.; and Pankovsky, Dmitry A., 4,311,530, Cl. 106-84.000.

Pautler, James A.; and Felix, Kenneth A., to Motorola, Inc. Method and apparatus for detecting a data signal including repeated data words. 4,312,074, Cl. 375-96.000.

Pav, Joseph; and Wenzel, Reinhard, to Kleinewefers GmbH. Rapid-separation mounting arrangement for rollers of a calendering machine. 4,311,091, Cl. 100-161.000.

Payne, Robert L. Hydroponics. 4,310,990, Cl. 47-59.000.

Payton, Raymus K.: *See—*
Lang, Paul W., 4,311,357, Cl. 350-6.900.

Pearson, Stanley, to Pantasote Inc. Flame resistant thermoplastic elastomer. 4,311,635, Cl. 260-42.490.

Pease, James F.: *See—*
Meckstroth, Alan F.; and Pease, James F., 4,310,956, Cl. 24-279.000.

Peckinpaugh, Frank L.; and Benton, Kenneth R., Sr., to Allied Corporation. Yarn winding method and apparatus to maintain tension during tail formation. 4,311,285, Cl. 242-18.0PW.

Pedder, David J., to Plessey Incorporated. Thick film circuits. 4,311,730, Cl. 427-102.000.

Pelkmann, Bernhard; Vogel, Dieter; and Schenkl, Alfred, to Siemens Aktiengesellschaft. Semiconductor circuit for speed control of electric motors. 4,311,949, Cl. 318-799.000.

Pellegrini, John P., Jr.; Austin, Richard G.; and Beach, David L., to Gulf Research & Development Company. Catalyst prepared from tungsten hexafluoride and a branched-chain alcohol. 4,311,613, Cl. 252-429.00R.

Pellegrini, John P., Jr.; Beach, David L.; and Kobylinski, Thaddeus P., to Gulf Research & Development Company. Method for preparing synthetic hydrocarbon fluids. 4,311,864, Cl. 585-530.000.

Pellegrini, Vittorio: *See—*
Manfre', Giovanni; and Pellegrini, Vittorio, 4,311,506, Cl. 65-59.600.

Pendell Boiler Limited: *See—*
Young, Walter H., 4,311,449, Cl. 431-284.000.

Penzien, Klaus: *See—*
Hahn, Klaus; Himmele, Walter; Naarmann, Herbert; and Penzien, Klaus, 4,311,636, Cl. 260-45.80N.

Pereman, Gordon F.: *See—*
Kellar, John D.; and Pereman, Gordon F., 4,311,503, Cl. 65-29.000.

Peress, Jimmy: *See—*
Jung, John A.; and Peress, Jimmy, 4,311,851, Cl. 560-233.000.

Perkin-Elmer Corporation, The: *See—*
deMey, Charles F.; and Young, Eugene F., 4,311,387, Cl. 356-318.000.

Perry, Andrew W., to Beckman Instruments, Inc. Kinetic method for directly determining total bilirubin. 4,311,483, Cl. 23-230.00B.

Perry, Eli, to Monsanto Company. Membrane separation of organics from aqueous solutions. 4,311,594, Cl. 210-640.000.

Pest, Jurgen, to General Electric Company. Fixed adjusted flat capacitor. 4,312,024, Cl. 361-271.000.

Peters, Klaus-Jurgen; Stiefel, Peter; and Ehrentraut, Heinz, to Robert Bosch GmbH. Differential pressure valve for a fuel injection system. 4,311,168, Cl. 137-549.000.

Petroleum Fermentations N.V.: *See—*
Gutnick, David L.; Rosenberg, Eugene; Belsky, Igal; and Zinaida, Zosim, 4,311,829, Cl. 536-18.000.
Gutnick, David L.; Rosenberg, Eugene; Belsky, Igal; and Zosim, Zinaida, 4,311,830, Cl. 536-53.000.
Gutnick, David L., Rosenberg, Eugene; Belsky, Igal; and Zinaida, Zosim, 4,311,831, Cl. 536-53.000.
Gutnick, David L.; Rosenberg, Eugene; Belsky, Igal; and Zinaida, Zosim, 4,311,832, Cl. 536-53.000.

Petrolite Corporation: *See—*
Bellos, Thomas J., 4,311,662, Cl. 422-12.000.
Quinlan, Patrick M., 4,311,663, Cl. 422-12.000.
Thompson, Neil E. S.; and Oude Alink, Bernardus A., 4,311,841, Cl. 544-231.000.

Peynaud, Francois: *See—*
Clavelloux, Noel; and Peynaud, Francois, 4,311,045, Cl. 73-170.00A.

Philip A. Hunt Chemical Corp.: *See—*
Sykes, Donald J., 4,311,551, Cl. 156-640.000.

Phillips, Edward H., to Optimetrix Corporation. Interferometrically controlled stage with precisely orthogonal axes of motion. 4,311,390, Cl. 356-358.000.

Phillips Petroleum Company: *See—*
Chapman, Charles C., 4,311,866, Cl. 585-719.000.
Kallenberger, Robert H., 4,311,672, Cl. 422-150.000.
King, William R., 4,310,973, Cl. 34-10.000.
Miller, Terry A., 4,312,051, Cl. 367-68.000.
Murtha, Timothy P.; and Drake, Charles A., 4,311,859, Cl. 564-491.000.
Small, William M., 4,311,187, Cl. 165-1.000.
Smith, Ernest L., 4,311,238, Cl. 206-508.000.
Smith, Richard L.; Farrar, Ralph C.; and Sonnenfeld, Richard J., 4,311,803, Cl. 525-53.000.

Picker Corporation: *See—*
Resnick, Theodore A.; and Dupuis, Walter A., 4,311,913, Cl. 250-409.000.

Pickering, Alan H.; and Rowlands, Geoffrey J., to English Electric Valve Company Limited. Magnetron having cavity wall vibrated by tuning fork. 4,311,968, Cl. 331-90.000.

Pierce, Richard V. Pneumatic engine. 4,311,084, Cl. 91-188.000.

Pieri in Primerano, Rita: *See—*
Primerano, Eugenio; and Pieri in Primerano, Rita, 4,311,209, Cl. 182-206.000.

Pieritz, John R.: *See—*
Gardner, Jeffrey M.; and Pieritz, John R., 4,311,100, Cl. 108-111.000.

Pietsch, Stephen J.: *See—*
Harper, Jon J.; and Pietsch, Stephen J., 4,311,521, Cl. 75-101.0BE.

Pilkington, Phillip. Quick detachable scope mount. 4,310,980, Cl. 42-1.0ST.

Pimenov, Anatoly N.; Putlyaev, Ivan E.; Otrepiev, Vladimir A.; Guzeev, Evgeny A.; Shesterkina, Natalya F.; Paturoev, Vasily V.; and Pankovsky, Dmitry A. Concrete mix and process for the manufacture of chemically stable structures and articles therefrom. 4,311,530, Cl. 106-84.000.

Pinet, Charles H. J.: *See—*
Duchateau, Georges F. M.; Pinet, Charles H. J.; and Hanot, Pierre X., 4,311,673, Cl. 422-272.000.

Pioneer Electronic Corporation: *See—*
Hasegawa, Tsunao, 4,312,020, Cl. 360-65.000.
Hirata, Hitoshi; and Nishioka, Akira, 4,311,928, Cl. 307-498.000.

Piper, Bert W. Vehicle parking signal device. 4,311,983, Cl. 340-51.000.

Piper, Ronald W.: *See—*
Goodacre, Ronald; and Piper, Ronald W., 4,311,205, Cl. 180-68.500.

Pitney Bowes Inc.: *See—*
Tolmie, Robert J., Jr., 4,311,956, Cl. 323-300.000.

Pittman, Roland, to Applied Devices Corporation. Multiple sensing device and sensing devices therefore. 4,311,046, Cl. 73-178.00R.

Plante, Theophile: *See—*
Demazeau, Gerard; Maestro, Patrick; Plante, Theophile; Pouchard, Michel; and Hagenmuller, Paul, 4,311,770, Cl. 428-694.000.

Plastiflex Company International: *See—*
Baker, John C.; Finley, Richard O.; Stanwood, David A.; and Bryson, Robert C., 4,310,946, Cl. 15-363.000.

Plate, Arthur: *See—*
Dudziak, Ernst; Kwauka, Gerd-Georg; Plate, Arthur; and Lubeck, Hermann, 4,311,090, Cl. 100-3.000.

Plessey Incorporated: *See—*
Pedder, David J., 4,311,730, Cl. 427-102.000.

Plyler, Robert G.; and Yurtin, John A., to General Motors Corporation. Weatherproof electrical connector. 4,311,355, Cl. 339-94.00R.

Poad, William J.: *See—*
Dembicki, Michael T.; and Poad, William J., 4,311,247, Cl. 215-232.000.

Poehler, Hermann; and Dziemba, Peter. Film reader. 4,311,370, Cl. 353-27.00R.

Poetsch, Dieter, to Robert Bosch GmbH. Method and system to scan motion picture film to develop television signals. 4,312,017, Cl. 358-214.000.

Pogany, Stefano A.: *See—*
Bodor, Nicholas S.; Sloan, Kenneth B.; and Pogany, Stefano A., 4,311,706, Cl. 424-301.000.

Polaroid Corporation: *See—*
Bloom, Stanley M., deceased; and Sachdev, Krishna G., 4,311,638, Cl. 260-330.000.
Borror, Alan L.; Cincotta, Louis; Foley, James W.; and Kampe, Marcis M., 4,311,839, Cl. 544-135.000.
Cournoyer, Richard L.; and Foley, James W., 4,311,847, Cl. 548-207.000.
Johnson, Bruce K.; and Morse, John B., 4,311,374, Cl. 354-144.000.
Raphael, Thomas, 4,311,774, Cl. 430-14.000.
Reynard, John M., 4,311,881, Cl. 179-111.00R.

Poli Industria Chimica S.p.A.: *See—*
Massaroli, Giangiacomo, 4,311,702, Cl. 424-256.000.

Politechnika Swietokrzyska: *See—*
Kajdas, Czeslaw; Nita, Jozef; and Krawczyk, Krzysztof, 4,311,036, Cl. 73-10.000.

Polyplastics Company, Ltd.: *See—*
Kitamura, Ryutaro; and Masubayashi, Hirotsugu, 4,311,477, Cl. 493-195.000.

Porter, George D., Jr. Apparatus for selective field application of herbicides to weeds. 4,310,988, Cl. 47-1.500.

Porter, Marion G.; and Norman, Robert W., Jr., to Honeywell Information Systems Inc. Instruction buffer apparatus of a cache unit. 4,312,036, Cl. 364-200.000.

Pouchard, Michel: *See—*
Demazeau, Gerard; Maestro, Patrick; Plante, Theophile; Pouchard, Michel; and Hagenmuller, Paul, 4,311,770, Cl. 428-694.000.

PPG Industries, Inc.: *See—*
Franz, Helmut, 4,311,764, Cl. 428-423.100.
Grove, William S., 4,311,515, Cl. 71-108.000.
Kellar, John D.; and Pereman, Gordon F., 4,311,503, Cl. 65-29.000.
McCann, Mary E., 4,311,566, Cl. 204-98.000.
Reader, William D.; and Wolfe, Terry L., 4,311,509, Cl. 65-351.000.
Schwenninger, Ronald L., 4,311,508, Cl. 65-182.500.
Starr, Eugene W.; and Shields, George B., 4,311,507, Cl. 65-114.000.
White, Preston S., 4,311,567, Cl. 204-98.000.

Precision Metering, Inc.: *See—*
Dolan, Stephen J., 4,311,170, Cl. 137-614.170.

Price, Ian M.; and Skelly, James K., to Ciba-Geigy Corporation. Dyeing composition. 4,311,480, Cl. 8-527.000.

Primerano, Eugenio; and Pieri in Primerano, Rita. Stepladders. 4,311,209, Cl. 182-206.000.

Produits Chimiques Ugine Kuhlmann: *See—*
Ochsenbein, Michel; and Ollivier, Jean-Paul, 4,311,814, Cl. 525-438.000.

Propster, Mark A., to Owens-Corning Fiberglas Corporation. Wet scrubbing-pelletizing method. 4,311,502, Cl. 65-27.000.

Protek A.G.: *See—*
Muller, Maurice E., 4,310,931, Cl. 3-1.913.

Provder, Theodore: *See—*
Koehler, Mark E.; Provder, Theodore; and Zander, Richard A., 4,311,039, Cl. 73-61.400.

Provensal, Jacques, to Regie Nationale des Usines Renault. Adjustable fixing device of a safety belt anchoring point. 4,311,323, Cl. 280-801.000.

Prudenziati, Maria, to Fabrica Italiana Magneti Marelli, S.p.A. Device for pressure measurement using a resistor strain gauge. 4,311,980, Cl. 338-4.000.

Public Service Company of New Mexico: *See—*
Nail, George R., 4,311,919, Cl. 307-64.000.

Pucci, Donald G., to General Electric Company. Curing agent for epoxy resin laminating compositions comprising a mixture of dicyandiamide and a tetra-alkylguanidine. 4,311,753, Cl. 428-251.000.

Puckette, Charles M., to General Electric Company. Variable excitation circuit. 4,311,922, Cl. 307-270.000.

Pugh, Charles D.: *See—*
London, Joe F., Jr.; and Pugh, Charles D., 4,311,000, Cl. 57-6.000.

Pulda, William F., to Vanguard Machinery Corp. Stacking of materials. 4,311,425, Cl. 414-84.000.

Puthawala, Anwer: *See—*
Bege, Dietmar; and Puthawala, Anwer, 4,311,531, Cl. 134-10.000.

Putlyaev, Ivan E.: *See—*
Pimenov, Anatoly N.; Putlyaev, Ivan E.; Otrepiev, Vladimir A.; Guzeev, Evgeny A.; Shesterkina, Natalya F.; Paturoev, Vasily V.; and Pankovsky, Dmitry A., 4,311,530, Cl. 106-84.000.

Putman, Thomas H.; and Ramey, Donald G., to Westinghouse Electric Corp. Low loss stabilizer. 4,311,253, Cl. 322-25.000.

Pyramid Optical, Inc.: *See—*
Buckley, Galen L.; and Martin, Harold W., 4,311,382, Cl. 356-5.000.

Q. P. Corporation: *See—*
Fujii, Noriomi, 4,311,089, Cl. 99-568.000.

Quad Chemical Corporation: *See—*
Abend, Phillip G., 4,311,692, Cl. 424-70.000.

Queen, Charles L. Steering mechanism for outboard motor. 4,311,471, Cl. 440-63.000.

Queneau, Paul B.; Beckstead, Leo W.; and Huggins, Dale K., to Amax Inc. Treatment of sodium tungstate leach liquor containing dissolved silica, phosphorus, and fluorine impurities. 4,311,679, Cl. 423-55.000.

Quest Medical, Inc.: *See—*
Smith, Gordon E., 4,311,139, Cl. 128-214.400.

Quinlan, Patrick M., to Petrolite Corporation. α-1,4-Thiazine alkanephosphonic acids as corrosion inhibitors. 4,311,663, Cl. 422-12.000.

Quinn, Thomas M.: *See—*
Berkowitz, Paul R.; Quinn, Thomas M.; Trimble, David C.; and Wang, Tse L., 4,311,878, Cl. 179-16.0EC.

Quinton Instrument Co.: *See—*
Modes, Vernon E.; Tam, Hak W.; Quinton, Wayne E.; Bailey, Alan G.; Niskanen, Robert A.; Vitez, Lou; and DeBardi, Gary A., 4,311,152, Cl. 128-641.000.

Quinton, Wayne E.: *See—*
Modes, Vernon E.; Tam, Hak W.; Quinton, Wayne E.; Bailey, Alan G.; Niskanen, Robert A.; Vitez, Lou; and DeBardi, Gary A., 4,311,152, Cl. 128-641.000.

Qvarnstrom, Lars A. G.: *See—*
Nylen, Ulf T. G.; and Qvarnstrom, Lars A. G., 4,311,789, Cl. 435-10.000.

Racciato, Joseph S., to Merck & Co., Inc. Use of heteropolysaccharide S-119 as a warp size. 4,311,601, Cl. 252-8.600.

Rackley, Ray A.; and Carpenter, David V., to Garrett Corporation, The. Radiant surface combustor. 4,311,447, Cl. 431-7.000.

Radel, Franz: *See—*
Sommer, Werner; Schieber, Hans; Krause, Erich; Radel, Franz; Trumper, Werner; Rieche, Henning; Tollkuhn, Dieter; Retallick, David; Weingartner, Albin; and Doslik, Peter R., 4,311,029, Cl. 66-75.200.

Radiochemical Centre Limited, The: *See—*
Cree, Gavin M., 4,311,853, Cl. 562-447.000.
Ruddock, Clinton F., 4,311,689, Cl. 424-1.000.

Raemy, Marius: *See—*
Mueller, Jean-Pierre; and Raemy, Marius, 4,311,542, Cl. 156-84.000.

Raffinerie Tirlemontoise: *See—*
Duchateau, Georges F. M.; Pinet, Charles H. J.; and Hanot, Pierre X., 4,311,673, Cl. 422-272.000.

Raghava, Ram S.; and West, Wilbur W., to Formica Corporation. Decorative metallic laminates. 4,311,757, Cl. 428-323.000.

Raghava, Ram S.; and Richardson, Calvin, to Formica Corporation. Process for the preparation of a fully hydrolyzed polyvinyl alcohol modified melamine-formaldehyde resin for application in decorative laminates. 4,311,804, Cl. 525-58.000.

Rainsfords Metal Products Pty. Ltd.: *See—*
Heath, Robert B., 4,311,339, Cl. 297-487.000.

Ralston Purina Company: *See—*
Betz, Norman L.; Lanter, Kent J.; and Williams, Danny L., 4,311,713, Cl. 426-2.000.

Ramesohl, Hubert: *See—*
Herchenbach, Horst; and Ramesohl, Hubert, 4,311,459, Cl. 432-247.000.

Ramey, Donald G.: *See—*
Putman, Thomas H.; and Ramey, Donald G., 4,311,253, Cl. 322-25.000.

Ramohalli, Kumar N. R.: *See—*
Humphrey, Marshall F.; Ramohalli, Kumar N. R.; and Dowler, Warren L., 4,311,630, Cl. 260-38.000.

Ranco Incorporated: *See—*
Walley, Don C., 4,311,190, Cl. 165-25.000.

Ransburg Corporation: *See—*
Scharfenberger, James A., 4,311,724, Cl. 427-8.000.

Raphael, Thomas, to Polaroid Corporation. Irradiation treatment of polymeric photographic film supports. 4,311,774, Cl. 430-14.000.

Ratcliff, Edward H., Jr., to W. R. Stamler Corporation, The. Device for fracturing material. 4,311,284, Cl. 241-191.000.

Ratner, Michael. Brake band end connection. 4,311,221, Cl. 188-259.000.

Ravve, Abraham; and Wilt, Paxton M., to Continental Group, Inc., The. Container having internal wall surfaces modified to reduce carbonation loss. 4,311,250, Cl. 220-458.000.

Raytheon Company: *See—*
Hurd, Wallace A., Jr.; and Youngren, Fred R., 4,311,005, Cl. 60-253.000.
Keene, Wayne H., 4,311,384, Cl. 356-152.000.
Keene, Wayne H., 4,311,385, Cl. 356-152.000.

RCA Corporation: *See—*
Bloom, Stanley; and Catanese, Carmen A., 4,311,944, Cl. 315-375.000.
Boyer, Lawrence A., 4,312,025, Cl. 361-289.000.
Faulkner, Richard D.; and McHose, Robert E., 4,311,939, Cl. 313-95.000.
Lang, Frank B.; Gibson, John J.; and Ross, Michael D., 4,312,013, Cl. 358-8.000.
Schade, Otto H., Jr., 4,311,967, Cl. 330-288.000.
Sterzer, Fred; and Paglione, Robert W., 4,311,154, Cl. 128-804.000.

Reader, William D.; and Wolfe, Terry L., to PPG Industries, Inc. Apparatus for conveying glass sheets. 4,311,509, Cl. 65-351.000.

Reagan, William J.: *See—*
Chen, Nai-Yuen; Miale, Joseph N.; and Reagan, William J., 4,311,865, Cl. 585-640.000.

Reber, Jean F.: *See—*
Steiger, Rolf; and Reber, Jean F., 4,311,786, Cl. 430-411.000.

Reddy, Prabhakara, to Eagle Comtronics, Inc. Wide band directional coupler. 4,311,974, Cl. 333-112.000.

Reeber, Morton D.: *See—*
Frieser, Rudolf G.; and Reeber, Morton D., 4,312,012, Cl. 357-82.000.

Reed, Kingstone L. H.; Danchuk, William; and Hatcher, Ian, to Koolatron Industries, Inc. Thermoelectric jug cooler. 4,311,017, Cl. 62-3.000.

Reed, Walter T.: *See—*
Foster, James P.; and Reed, Walter T., 4,310,985, Cl. 43-131.000.

Regal International, Inc.: *See—*
Guilbeau, Edgar A., 4,311,412, Cl. 405-212.000.

Regan, Michael T., to Eastman Kodak Company. Novel phthalocyanine pigments and electrophotographic uses thereof. 4,311,775, Cl. 430-37.000.

Regie Nationale des Usines Renault: *See—*
Balaud, Daniel; Keledjian, Gaston; and Passemard, Jean R., 4,310,958, Cl. 29-26.00A.
Provensal, Jacques, 4,311,323, Cl. 280-801.000.

Reid, David: *See—*
Isberg, Gary J.; Wickman, Klaus; and Reid, David, 4,310,972, Cl. 30-382.000.

Reid, David L.; and Taylor, Dennis O., to Cummins Engine Company, Inc. Diagnosis of engine lubricant system. 4,311,041, Cl. 73-117.300.

Reid, David L.; and Taylor, Dennis O., to Cummins Engine Company, Inc. Method and apparatus for detecting air in fuel. 4,311,043, Cl. 73-119.00A.

Reinhall, Rolf B. Method of manufacturing fiberboard. 4,311,555, Cl. 162-206.000.

Reinhard Mohn OHG: *See—*
Dudziak, Ernst; Kwauka, Gerd-Georg; Plate, Arthur; and Lubeck, Hermann, 4,311,090, Cl. 100-3.000.

Reischl, Artur, to Bayer Aktiengesellschaft. Process for working up cross-linked isocyanate distillation residues containing urea groups and use of the products of the process as starting components for the production of synthetic resins. 4,311,800, Cl. 521-109.000.

Reisner, Josef: *See*—
Opavsky, Werner; Reisner, Josef; and Maier, Alois, 4,311,563, Cl. 203-46.000.

Remington Arms Company, Inc.: *See*—
Kast, Jack L.; and Young, Edgar J., 4,310,982, Cl. 42-75.00B.

Rempfler, Hermann: *See*—
Bohner, Beat; and Rempfler, Hermann, 4,311,513, Cl. 71-92.000.
Szczepanski, Henry; Rohr, Otto; and Rempfler, Hermann, 4,311,514, Cl. 71-94.000.

Republic Steel Corporation: *See*—
Bhattacharyya, Aniruddha, 4,311,597, Cl. 210-731.000.

Research Cottrell, Inc.: *See*—
Bibbo, Peter P.; Hankins, Frederick E.; and Jakoplic, Richard, 4,311,491, Cl. 55-2.000.

Resnick, Theodore A.; and Dupuis, Walter A., to Picker Corporation. X-Ray tube current control. 4,311,913, Cl. 250-409.000.

Retallick, David: *See*—
Sommer, Werner; Schieber, Hans; Krause, Erich; Radel, Franz; Trumper, Werner; Rieche, Henning; Tollkuhn, Dieter; Retallick, David; Weingartner, Albin; and Doslik, Peter R., 4,311,029, Cl. 66-75.200.

Rey, Pierre; Leandri, Jacqueline; and Abbou, Clement, to Agence Nationale de Valorisation de la Recherche (ANVAR). Processes for the manufacture of organ prostheses. 4,311,659, Cl. 264-221.000.

Reynard, John M., to Polaroid Corporation. Electrostatic transducer backplate having open ended grooves. 4,311,881, Cl. 179-111.00R.

Reynolds, Blake W.: *See*—
Henley, Roger; and Reynolds, Blake W., 4,311,884, Cl. 200-5.00R.

Rheinmetall GmbH: *See*—
Backstein, Guenter; and Unger, Hans W., 4,311,097, Cl. 102-229.000.

Rhodes, Buck A.: *See*—
Burchiel, Scott W.; Crockford, David R.; and Rhodes, Buck A., 4,311,688, Cl. 424-1.000.

Rhodes, Louis C.: *See*—
McCullough, J. Douglas, Jr.; and Rhodes, Louis C., 4,311,807, Cl. 525-197.000.

Rhone-Poulenc Industries: *See*—
Fayolle, Bernard, 4,311,824, Cl. 528-190.000.

Rice, Warren, to Natural Energy Systems. Gas compression system. 4,311,025, Cl. 62-502.000.

Rich. Seifert & Co. GmbH & Co. KG: *See*—
Ries, Karl; Hannoschock, Kurt; Rozic, Krsto-Marijan; Basler, Gunter; Sperl, Harald; and Weinschenk, Kurt, 4,311,905, Cl. 250-321.000.

Richard Wolf GmbH: *See*—
Hausler, Eberhard, 4,311,147, Cl. 128-328.000.

Richardson, Calvin: *See*—
Raghava, Ram S.; and Richardson, Calvin, 4,311,804, Cl. 525-58.000.

Ricoh Company, Ltd.: *See*—
Iwasaki, Kyuhachiro, 4,312,005, Cl. 346-75.000.
Kubo, Keishi; and Tanaka, Tetsuo, 4,311,750, Cl. 428-212.000.
Mochizuki, Manabu; and Ohno, Yukihiro, 4,311,780, Cl. 430-125.000.

Rieche, Henning: *See*—
Sommer, Werner; Schieber, Hans; Krause, Erich; Radel, Franz; Trumper, Werner; Rieche, Henning; Tollkuhn, Dieter; Retallick, David; Weingartner, Albin; and Doslik, Peter R., 4,311,029, Cl. 66-75.200.

Riedel, Tilo H., to Sesamat Anstalt. Lever-operable fastener for shoes. 4,310,951, Cl. 24-68.0SK.

Ries, Karl; Hannoschock, Kurt; Rozic, Krsto-Marijan; Basler, Gunter; Sperl, Harald; and Weinschenk, Kurt, to Mannesmann Aktiengesellschaft; and Rich. Seifert & Co. GmbH & Co. KG. Film strip positioning for X-ray testing of pipes. 4,311,905, Cl. 250-321.000.

Riessland, Eberhard; Wagner, Wolfgang; and Opitz, Gunter. Capacitive measuring sensor. 4,311,959, Cl. 324-61.00P.

Rieter Machine Works Ltd.: *See*—
Schenkel, Eduard, 4,311,916, Cl. 250-561.000.

Rifkin, Ellis B., to Ethyl Corporation. Method for inhibiting deposit formation in process equipment associated with separation and purification of alkyl phosphorochloridothioates. 4,311,562, Cl. 203-7.000.

Rigazio, Elio; Rossi, Galileo; and Salussolia, Piero. Device for the checking of the pressure of tires of a motor vehicle. 4,311,984, Cl. 340-58.000.

Riggs, William D.; and Schegan, Joseph J., to North American Philips Corporation. Brushless direct current motor. 4,311,933, Cl. 310-156.000.

Rijckaert, Albert M. A.: *See*—
de Niet, Edmond; and Rijckaert, Albert M. A., 4,312,073, Cl. 375-19.000.

Rimbey, Roger J., to SCM Corporation. Acoustic transmission member. 4,311,991, Cl. 340-365.00R.

Ringle, Gerald D. Adapter for bleeding brake lines. 4,311,326, Cl. 285-62.000.

Ringspann Albrecht Maurer K.G.: *See*—
Maurer, Ruprecht, 4,311,220, Cl. 188-170.000.

Riordan, Daniel T.: *See*—
Sherwood, Donald W.; and Riordan, Daniel T., 4,311,620, Cl. 260-9.000.

Rizzi, Marc A.: *See*—
Hold, Peter; Notte, Angelo J.; and Rizzi, Marc A., 4,311,446, Cl. 425-144.000.

Robben, Paul J.; and De Vuyst, Hugo R., to N. V. Klippan S.A. Buckle with readily releasable latch. 4,310,952, Cl. 24-230.00A.

Robbins, Henry M., Jr., to Mine Safety Appliances Company. Ferrite antenna. 4,312,003, Cl. 343-788.000.

Roberson, Cletis L.; and Langlois, Roland E., to Owens-Corning Fiberglas Corporation. Method of and means for removal of glass floods from a surface of a glass stream feeder. 4,311,500, Cl. 65-2.000.

Robert Bosch GmbH: *See*—
Breckel, Werner; and Wurst, Bert, 4,311,924, Cl. 307-354.000.
Glockler, Otto; Gunther, Dieter; Steinbrenner, Ulrich; Schulzke, Peter; and Sieber, Albrecht, 4,311,123, Cl. 123-325.000.
Peters, Klaus-Jurgen; Stiefel, Peter; and Ehrentraut, Heinz, 4,311,168, Cl. 137-549.000.
Poetsch, Dieter, 4,312,017, Cl. 358-214.000.
Schulzke, Peter, 4,311,124, Cl. 123-333.000.

Roberts, Arden J., to Federal-Mogul Corporation. Sleeve bearing. 4,311,349, Cl. 308-122.000.

Roberts, Judith. Lap tray. 4,311,099, Cl. 108-47.000.

Roberts, Maurice P., to TRW Inc. Hydrostatic steering controller with pressure dams. 4,311,171, Cl. 137-625.230.

Robertshaw Controls Company: *See*—
Newell, Dennis E., 4,311,497, Cl. 62-158.000.

Robin, Marcel, to Commissariat a l'Energie Atomique. Heat exchanger. 4,311,189, Cl. 165-11.00R.

Robinson, Darrell; and Bell, John C., to Ekstrom Industries, Inc. Meter disconnect adaptor. 4,311,354, Cl. 339-36.000.

Robinson, John M.: *See*—
Holt, William D.; and Robinson, John M., 4,311,961, Cl. 324-418.000.

Robinson, Thomas C., to Thoratec Laboratories Corporation. Intra-aortic balloon. 4,311,133, Cl. 128-1.00D.

Rocco, Frank L.: *See*—
Marmo, Don; and Rocco, Frank L., 4,311,720, Cl. 426-594.000.

Roche, Marcel, to Thomson-CSF. Method of making self-aligned differently doped regions by controlled thermal flow of photoresist layer. 4,311,533, Cl. 148-1.500.

Rock, Erich; and Mages, Bernhard, to Julius Blum Gesellschaft m.b.H. Hinge with a telescopic arm lever closing device. 4,310,948, Cl. 16-335.000.

Rock Oil Corporation: *See*—
Jubenville, Duncan B.; and DeGrazia, Melvin G., Jr., 4,311,157, Cl. 134-125.000.

Rockefeller University, The: *See*—
Goulianos, Konstantin; Smith, Karen K.; and White, Sebastian N., 4,311,908, Cl. 250-374.000.

Rockwell International Corporation: *See*—
Barr, Frank P., 4,311,960, Cl. 324-103.00P.
Hodson, Donald R.; and Massie, Norbert A., 4,311,360, Cl. 350-174.000.
Landt, Harvey L.; and Mooty, Donald J., 4,311,972, Cl. 333-17.00M.

Rofer-DePoorter, Cheryl K.: *See*—
Lyons, William C.; Rofer-DePoorter, Cheryl K.; Buddecke, Donald B.; and Zublin, Edward A., 4,311,340, Cl. 299-4.000.

Rogic, Milorad M.: *See*—
Demmin, Timothy R.; and Rogic, Milorad M., 4,311,850, Cl. 560-131.000.

Rohm and Haas Company: *See*—
Emmons, William D.; and Kaplan, Fred A., 4,311,624, Cl. 260-22.0CB.
Manziek, Larry, 4,311,811, Cl. 525-332.000.
Manziek, Larry, 4,311,812, Cl. 525-337.000.

Rohr, Otto: *See*—
Szczepanski, Henry; Rohr, Otto; and Rempfler, Hermann, 4,311,514, Cl. 71-94.000.

Rohrenbacher, Ronald C.: *See*—
Macrorie, Patrick L.; Rohrenbacher, Ronald C.; and Austin, Stephen B., 4,311,208, Cl. 182-18.000.

Roiret, Michel C.; and Salles, Aime M., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Visibility measuring device. 4,311,388, Cl. 356-341.000.

Rojey, Alexandre; and Cohen, Georges, to Institut Francais du Petrole. Process for producing cold and/or heat with use of an absorption cycle. 4,311,019, Cl. 62-101.000.

Rollei-Werke Franke & Heidecke GmbH & Co. KG: *See*—
Kranz, Gerhard, 4,311,373, Cl. 354-43.000.

Rolls-Royce Limited: *See*—
Hall, John M., 4,311,276, Cl. 239-265.390.

Rose, George R., Jr., to Grumman Aerospace Corporation. Hose reel automatic brake. 4,311,165, Cl. 137-355.120.

Rosemount, Inc.: *See*—
Cucci, Gerald R., 4,311,053, Cl. 73-704.000.

Rosenberg, Eugene: *See*—
Gutnick, David L.; Rosenberg, Eugene; Belsky, Igal; and Zinaida, Zosim, 4,311,829, Cl. 536-18.000.
Gutnick, David L.; Rosenberg, Eugene; Belsky, Igal; and Zosim, Zinaida, 4,311,830, Cl. 536-53.000.
Gutnick, David L.; Rosenberg, Eugene; Belsky, Igal; and Zinaida, Zosim, 4,311,831, Cl. 536-53.000.
Gutnick, David L.; Rosenberg, Eugene; Belsky, Igal; and Zinaida, Zosim, 4,311,832, Cl. 536-53.000.

Rosenberger, Michael, to Hoffmann-La Roche Inc. Synthesis of SRS-active compounds. 4,311,645, Cl. 260-348.610.

Ross, Michael D.: *See*—
Lang, Frank B.; Gibson, John J.; and Ross, Michael D., 4,312,013, Cl. 358-8.000.
Rossi, Galileo: *See*—
Rigazio, Elio; Rossi, Galileo; and Salussolia, Piero, 4,311,984, Cl. 340-58.000.
Roth, Barbara; Miller, Alistair A.; and Sawyer, David A. Treatment of convulsions with triazines. 4,311,701, Cl. 424-249.000.
Rotoflow Corporation: *See*—
du Pont, Anthony A., 4,311,004, Cl. 60-39.050.
Roux, Evelyne, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Binary converter in particular for transmitters and receivers of reduced redundancy image data. 4,311,989, Cl. 340-347.0DD.
Rowell, Geoffrey D. Vegetable slicer. 4,310,971, Cl. 30-279.00R.
Rowlands, Geoffrey J.: *See*—
Pickering, Alan H.; and Rowlands, Geoffrey J., 4,311,968, Cl. 331-90.000.
Rozic, Krsto-Marijan: *See*—
Ries, Karl; Hannoschock, Kurt; Rozic, Krsto-Marijan; Basler, Gunter; Sperl, Harald; and Weinschenk, Kurt, 4,311,905, Cl. 250-321.000.
Rozycki, Czeslaw: *See*—
Zaremba, Marek; Rozycki, Czeslaw; and Staszewski, Rafal, 4,311,664, Cl. 422-54.000.
Rubner, Roland: *See*—
Ahne, Hellmut; Kuhn, Eberhard; Rubner, Roland; and Schmidt, Erwin, 4,311,785, Cl. 430-283.000.
Ruckert, Hans: *See*—
Buhr, Gerhard; and Ruckert, Hans, 4,311,782, Cl. 430-270.000.
Rucktenwald, Thomas E.; Braun, William E., Jr.; Lazare, Louis S.; Lin, Sharming; and Melcher, Byron, to Whirlpool Corporation. Electronic musical instrument with harmony generation. 4,311,076, Cl. 84-1.030.
Ruddock, Clinton F., to Radiochemical Centre Limited, The. Method and container for production of diagnostic scanning. 4,311,689, Cl. 424-1.000.
Rudolph, Joseph S.: *See*—
Stana, Regis R.; Mitchell, Edward; Rudolph, Joseph S.; and Lopez, Jose G., 4,311,675, Cl. 423-8.000.
Ruhrchemie Aktiengesellschaft: *See*—
Weber, Jurgen; Falk, Volker; and Kniep, Claus, 4,311,854, Cl. 562-531.000.
Rulseh, Roger D., to AMF Incorporated. Timing apparatus for lamps and appliances. 4,311,886, Cl. 200-38.00R.
Rummel, Mitzie K., to Du Pont de Nemours, E. I., and Company. Non-stick coated steel article. 4,311,755, Cl. 428-312.600.
Runkle, Dean E., to Bendix Corp., The. Hydraulic brake booster. 4,311,085, Cl. 91-391.00R.
Rusche, Fredric. Pre-load jack system and method of driving element into the ground. 4,311,416, Cl. 405-232.000.
Rust, Rudolph. Carnot cycle heat operated motor. 4,311,015, Cl. 60-675.000.
Rusznyak, Andreas: *See*—
Luscher, Jakob; and Rusznyak, Andreas, 4,311,923, Cl. 307-304.000.
Ryan, D. F.: *See*—
Fant, B. T.; Miller, John D.; and Ryan, D. F., 4,311,578, Cl. 208-8.0LE.
Ryan, John O., to Ampex Corporation. Input video processor for color television cameras. 4,312,014, Cl. 358-41.000.
Sabeti, Faramarz M. Evacuated heatpipe solar collector. 4,311,131, Cl. 126-433.000.
Sachdev, Krishna G.: *See*—
Bloom, Stanley M., deceased; and Sachdev, Krishna G., 4,311,638, Cl. 260-330.000.
Sachs, Bertram, to Siemens Aktiengesellschaft. Method for the manufacture of ultrasonic heads. 4,310,957, Cl. 29-25.350.
Saeki, Ikuo: *See*—
Toudo, Kenzi; Miyanaka, Motoshi; Saeki, Ikuo; and Nakaoka, Yosiaki, 4,311,576, Cl. 204-196.000.
Safe Flight Instrument Corporation: *See*—
Bloch, Ramon, 4,312,071, Cl. 371-57.000.
SAFFA S.p.A: *See*—
Camos, Arturo, 4,311,450, Cl. 431-344.000.
Sahara, Masayoshi: *See*—
Kobori, Toshio; and Sahara, Masayoshi, 4,311,371, Cl. 354-34.000.
Sailors, Clyde A., Jr., to Continental Carbon Company. Air flow bag packer spout and hood assembly. 4,311,173, Cl. 141-68.000.
St. Clair, Anne K.: *See*—
United States of America, National Aeronautics and Space Administration; Taylor, Larry T.; St. Clair, Anne K.; Carver, Vicki C.; and Furtsch, Thomas A., 4,311,615, Cl. 252-514.000.
Saint Marcoux, Roland: *See*—
Frappart, Pierre; Guichard, Serge; and Saint Marcoux, Roland, 4,312,023, Cl. 361-243.000.
Saito, Tadao; Akutsu, Masao; Sugiura, Hiroaki; and Endo, Shuzo, to Yoshino Kogyosho Co., Ltd. Synthetic resin bottle with handle. 4,311,246, Cl. 215-100.00A.
Saito, Takeshi; Ueno, Takashi; and Kashiwagi, Hideo, to Toray Industries, Inc. Light shielding material. 4,311,368, Cl. 351-165.000.
Sakai, Nobuo: *See*—
Mifune, Hiroyuki; Takada, Shunji; Akimura, Yoshitaka; and Sakai, Nobuo, 4,311,781, Cl. 430-264.000.
Salama, Amal M.: *See*—
United States of America, National Aeronautics and Space Administration; and Salama, Amal M., 4,311,870, Cl. 136-261.000.
Salerno, Michael. Sliding door safety device. 4,310,947, Cl. 16-83.000.
Salles, Aime M.: *See*—
Roiret, Michel C.; and Salles, Aime M., 4,311,388, Cl. 356-341.000.
Salopek, Albert; and Emery, Joseph. Component taping machine. 4,311,544, Cl. 156-510.000.
Saltzman, Robert S.; and Williams, James W., to Du Pont de Nemours, E. I., and Company. Method and apparatus for photometrically monitoring the concentrations of both chlorine and chlorine dioxide. 4,311,485, Cl. 23-230.00R.
Salussolia, Piero: *See*—
Rigazio, Elio; Rossi, Galileo; and Salussolia, Piero, 4,311,984, Cl. 340-58.000.
Salzman, Allen W., to Marchem Products Company. Lubrication system for a thrust bearing. 4,311,350, Cl. 308-160.000.
Samek, Norbert E.; Garland, Thomas H.; and Connor, Robert J., to Bell & Howell Company. Methods and apparatus for recording electric signals. 4,312,004, Cl. 346-1.100.
Sanayama, Masaki: *See*—
Kawaguchi, Hiroshi; and Sanayama, Masaki, 4,311,060, Cl. 74-142.000.
Sanchez, Joseph P.: *See*—
Haskell, Theodore H.; Mich, Thomas F.; Sanchez, Joseph P.; and Schweiss, Dietrich, 4,311,699, Cl. 424-246.000.
Sankewitsch, Vladimir: *See*—
Desjardins, Rene A.; and Sankewitsch, Vladimir, 4,311,213, Cl. 188-380.000.
Sanny Industry Co., Ltd.: *See*—
Onoue, Toshikatsu, 4,310,999, Cl. 56-295.000.
Sano, Toshiaki: *See*—
Okada, Tamio; and Sano, Toshiaki, 4,311,301, Cl. 266-196.000.
Sanofi: *See*—
Braye, Emile H.; and Ollivier, Jean-Marie, 4,311,845, Cl. 546-114.000.
Sansregret, Joseph L., to Exxon Research & Engineering Co. Method for depositing photoconductive zinc tin phosphide. 4,311,728, Cl. 427-74.000.
Sanvik Aktiebolag: *See*—
Sundstrom, Erik W., 4,311,075, Cl. 83-848.000.
Sasaki, Takehiko: *See*—
Fukuda, Hiroaki; Sasaki, Takehiko; and Mori, Hiroshi, 4,311,953, Cl. 320-2.000.
Sasaki, Yutaka; Moriya, Kiyoshi; and Nakamura, Yoshimi, to Nitto Chemical Industry, Co., Ltd. Process for regenerating an antimony containing oxide catalyst. 4,311,611, Cl. 252-412.000.
Sasano, Akira: *See*—
Kaneko, Tadao; Hashimoto, Michiaki; Nakano, Toshio; and Sasano, Akira, 4,311,773, Cl. 430-7.000.
Sato, Akihiko: *See*—
Narumi, Tadataka; and Sato, Akihiko, 4,311,161, Cl. 137-117.000.
Sato Gosei Co., Ltd.: *See*—
Suzuki, Tadashi, 4,310,962, Cl. 29-417.000.
Sato, Katsuhiko: *See*—
Ueda, Makoto; Torisawa, Akira; Otawa, Shuji; Mandai, Masaaki; Shida, Masaharu; and Sato, Katsuhiko, 4,311,947, Cl. 318-696.000.
Sato, Katsuo: *See*—
Okada, Shigeo; and Sato, Katsuo, 4,311,421, Cl. 411-59.000.
Satoh, Katsuhiko: *See*—
Mandai, Masaaki; Torisawa, Akira; Ueda, Makoto; Asano, Kazuhiro; Shida, Masaharu; and Satoh, Katsuhiko, 4,312,059, Cl. 368-157.000.
Sauer, Hans; Kasano, Humihiro; and Isobe, Yoichi, to Matsushita Electric Works, Ltd.; and Sauer, Hans. Polarized reed relay. 4,311,976, Cl. 335-78.000.
Savard, Guy; and Lee, Robert G. H., to Canadian Liquid Air Ltd./Air Liquide Canada Ltee. Homogenization of metal using gas. 4,311,518, Cl. 75-59.000.
Sawyer, David A.: *See*—
Roth, Barbara; Miller, Alistair A.; and Sawyer, David A., 4,311,701, Cl. 424-249.000.
Scalera, Michael R.: *See*—
Marshall, Christine A.; and Scalera, Michael R., 4,311,044, Cl. 73-146.000.
Scarfe, Arthur: *See*—
Bower, Lewis R. B.; Scarfe, Arthur; and Smith, John C., 4,311,417, Cl. 405-297.000.
Schade, Otto H., Jr., to RCA Corporation. Compensation for transistor output resistance. 4,311,967, Cl. 330-288.000.
Schaefer, Harold W.; Thomas, Joyce K.; and Hohulin, Samuel E., to National Union Electric Corporation. Vacuum cleaner bag assembly. 4,311,493, Cl. 55-369.000.
Schaefer, Hartmann, to BYK Gulden Lomberg Chemische Fabrik GmbH. Pyrimidobenzodiazepinones, their use and medicaments containing them. 4,311,700, Cl. 424-248.540.
Schafer-Burkhard, Werner. Cleanser with ionic and nonionic surfactants. 4,311,618, Cl. 252-542.000.
Schaltbau Gesellschaft mbH: *See*—
Keller, Gerhard, 4,311,359, Cl. 350-96.200.
Schaper, Ulf-Armin; and Bruns, Klaus. Method of preparing perfume compositions that contain tricyclo[5.2.1.$0^{2,6}$]decane carboxylic acid esters. 4,311,616, Cl. 252-522.00R.
Schapira, Joseph; Ken, Victor; Masson, Jean C.; and Duboys, Francois J., to Compagnie Francaise de Produits Industriels. Processes of

phosphating surfaces of iron and of steel with manganese. 4,311,536, Cl. 148-6.15R.
Scharfenberger, James A., to Ransburg Corporation. Variable low-pressure air color change cycle. 4,311,724, Cl. 427-8.000.
Schatz, Friedrich: *See—*
Hoffmann, Ernst; Schatz, Friedrich; and Unger, Artur, 4,311,002, Cl. 57-293.000.
Scheffel, Gerd. Cartridge element control. 4,311,296, Cl. 251-29.000.
Schegan, Joseph J.: *See—*
Riggs, William D.; and Schegan, Joseph J., 4,311,933, Cl. 310-156.000.
Scheirer, Winfried: *See—*
Katinger, Hermann; and Scheirer, Winfried, 4,311,798, Cl. 435-286.000.
Schenkel, Eduard, to Rieter Machine Works Ltd. Travelling scanning apparatus for successively scanning the working conditions at each spinning position of a ring spinning machine. 4,311,916, Cl. 250-561.000.
Schenkl, Alfred: *See—*
Pelkmann, Bernhard; Vogel, Dieter; and Schenkl, Alfred, 4,311,949, Cl. 318-799.000.
Schering Corporation: *See—*
Nagabhushan, Tattanahalli L., 4,311,857, Cl. 564-212.000.
Schickfluss, Rudolf, to Hoechst Aktiengesellschaft. Water-insoluble azlactone dyestuffs, processes for their preparation and their use for dyeing or printing synthetic fiber materials. 4,311,836, Cl. 542-443.000.
Schido, Friedrich: *See—*
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; Ernst, Horst M.; and Schido, Friedrich, 4,311,348, Cl. 308-6.00C.
Schieber, Hans: *See—*
Sommer, Werner; Schieber, Hans; Krause, Erich; Radel, Franz; Trumper, Werner; Rieche, Henning; Tollkuhn, Dieter; Retallick, David; Weingartner, Albin; and Doslik, Peter R., 4,311,029, Cl. 66-75.200.
Schlegel, Earl S.: *See—*
Bartko, John; Tarneja, Krishan S.; Chu, Chang K.; and Schlegel, Earl S., 4,311,534, Cl. 148-1.500.
Schlicker, Melvin C., to Corning Glass Works. Television panel package. 4,311,239, Cl. 206-597.000.
Schlingmann, Gerhard: *See—*
Koppenhagen, Volker; Schlingmann, Gerhard; Dresow, Bernd; and Ebelmann, Ortrud, 4,311,643, Cl. 260-314.000.
Schlumberger Limited: *See—*
Tinch, David H.; Carpenter, Bruce N.; and Eliahou, Elie S., 4,312,040, Cl. 364-422.000.
Schmidt, Erwin: *See—*
Ahne, Hellmut; Kuhn, Eberhard; Rubner, Roland; and Schmidt, Erwin, 4,311,785, Cl. 430-283.000.
Schmitt, Frederick L.: *See—*
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,311,602, Cl. 252-8.600.
Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,311,754, Cl. 428-284.000.
Schmitt, Guenter: *See—*
Krumme, Hans-Jochen; and Schmitt, Guenter, 4,311,911, Cl. 250-445.00T.
Schneider, Thomas E.: *See—*
Funcik, Jack F.; Bennet, Joseph C.; Tubbs, Joseph T.; and Schneider, Thomas E., 4,310,967, Cl. 29-749.000.
Schnell, Russell C.: *See—*
Youngman, Edward A.; and Schnell, Russell C., 4,311,517, Cl. 71-121.000.
Schoen, Hans. System for damping abrupt movement of a punch press ram. 4,311,086, Cl. 92-10.000.
Schoening, Josef: *See—*
Schwiers, Hans-Georg; and Schoening, Josef, 4,311,558, Cl. 376-296.000.
Schoeppel, Roger J.: *See—*
Terry, Lynn E.; and Schoeppel, Roger J., 4,311,014, Cl. 60-649.000.
Schopper, Bernd, to ITT Industries, Inc. Two-circuit pressure regulator. 4,311,345, Cl. 303-84.00A.
Schreiber, Hinda S.; Lindahl, Eugenie Z.; and Smith, Polly P., to Jogbra Incorporated. Athletic brassiere. 4,311,150, Cl. 128-494.000.
Schreiner, Lester D.: *See—*
Steilen, Ronald M.; and Schreiner, Lester D., 4,311,104, Cl. 111-85.000.
Schroder, Gunther, to BBC Brown, Boveri & Company, Limited. High-voltage, blast-actuated power switch having a deformable bridge conductor. 4,311,890, Cl. 200-61.080.
Schroeder Brothers Corporation: *See—*
Cobb, William R., 4,311,347, Cl. 308-3.900.
Schuhmann, Bernd, to Mannesmann Aktiengesellschaft. Reduction gear and speed control for dredge pumps. 4,311,066, Cl. 74-687.000.
Schulzke, Peter, to Robert Bosch GmbH. Signal generator for suppression of fuel supply actuation at top engine speed. 4,311,124, Cl. 123-333.000.
Schulzke, Peter: *See—*
Glockler, Otto; Gunther, Dieter; Steinbrenner, Ulrich; Schulzke, Peter; and Sieber, Albrecht, 4,311,123, Cl. 123-325.000.
Schuster, Eberhard: *See—*
Janner, Karl; Gregorius, Klaus; Niemann, Hans-Joachim; Kersting, Arno; and Schuster, Eberhard, 4,311,674, Cl. 423-3.000.
Schwaab, Inc.: *See—*
Nettesheim, Daniel R.; and Guyer, Robert R., 4,311,381, Cl. 355-100.000.
Schwab, Rolf; and Stralka, Herbert, to Siemens Aktiengesellschaft. Pick-off device for an automatic stacker. 4,311,424, Cl. 414-27.000.
Schwander, Hansrudolf: *See—*
Bersier, Jacques; Jager, Horst; and Schwander, Hansrudolf, 4,311,565, Cl. 204-73.00R.
Schwartz, Herbert. Bactericidal water-soluble complexes. 4,311,512, Cl. 71-67.000.
Schwarz, Josef: *See—*
Brugger, Karl; and Schwarz, Josef, 4,311,073, Cl. 83-23.000.
Schwarze, Rigobert. Pipe bending machine. 4,311,031, Cl. 72-133.000.
Schweiss, Dietrich: *See—*
Haskell, Theodore H.; Mich, Thomas F.; Schweiss, Dietrich; and Culbertson, Townley P., 4,311,698, Cl. 424-246.000.
Haskell, Theodore H.; Mich, Thomas F.; Sanchez, Joseph P.; and Schweiss, Dietrich, 4,311,699, Cl. 424-246.000.
Schwenninger, Ronald L., to PPG Industries, Inc. Float glass forming chamber with cast roof. 4,311,508, Cl. 65-182.500.
Schwiers, Hans-Georg; and Schoening, Josef, to Hochtemperatur-Reaktorbau GmbH. Pressure vessel for a nuclear power plant. 4,311,558, Cl. 376-296.000.
SCM Corporation: *See—*
Rimbey, Roger J., 4,311,991, Cl. 340-365.00R.
Scott Paper Company: *See—*
Gotchel, Joel P.; and Neuenschwander, Rudolf, 4,311,037, Cl. 73-38.000.
Mattor, John A., 4,311,766, Cl. 428-514.000.
Scovill Inc.: *See—*
Kral, Stephen L., 4,311,329, Cl. 292-92.000.
Scragg, Frederick; Scragg, Michael L.; and Marshman, Peter, to Mantec Industries Limited. Positive displacement device. 4,311,441, Cl. 417-383.000.
Scragg, Michael L.: *See—*
Scragg, Frederick; Scragg, Michael L.; and Marshman, Peter, 4,311,441, Cl. 417-383.000.
Sealed Motor Construction Co. Ltd.: *See—*
Clark, Ronald J., 4,311,937, Cl. 310-268.000.
Sealing AG: *See—*
Kronenberg, Ernst A., 4,311,315, Cl. 277-95.000.
Seely, Charles R. Method and apparatus for copy-fitting. 4,311,903, Cl. 235-88.00R.
Seely, James R., to Embossed Door Corporation. Door sealing system. 4,310,991, Cl. 49-470.000.
Seeney, Charles E.; Kraemer, John F.; and Hoffman, Larry J., to Aristo Corporation. Cold set phenol-formaldehyde resin. 4,311,619, Cl. 260-7.000.
Segal, Leon: *See—*
Dege, Gerald J.; Segal, Leon; DeBona, Bruce T.; and Cooke, Robert S., 4,311,822, Cl. 528-176.000.
Seino, Kuniki; and Ozaki, Yoshihiro, to Minolta Camera Kabushiki Kaisha. Electrophotographic image forming method. 4,311,776, Cl. 430-48.000.
Seino, Kuniki; and Ozaki, Yoshihiro, to Minolta Camera Kabushiki Kaisha. Method for forming an electrostatic latent image. 4,311,777, Cl. 430-48.000.
Seitz, Martin V.: *See—*
Coombes, Daniel J.; and Seitz, Martin V., 4,312,070, Cl. 371-40.000.
Senzaki, Takashi: *See—*
Yasuhara, Kiyotada; Takahashi, Masashi; Murakami, Ryoichi; and Senzaki, Takashi, 4,311,535, Cl. 148-6.15Z.
Serono Laboratories Inc.: *See—*
Burchiel, Scott W.; Crockford, David R.; and Rhodes, Buck A., 4,311,688, Cl. 424-1.000.
Service d'Exploitation Industrielle des Tabacs et des Allumettes: *See—*
Dameret, Jean-Louis; Maximilien, Jacques; and Paret, Jacques, 4,311,155, Cl. 131-280.000.
Sesamat Anstalt: *See—*
Riedel, Tilo H., 4,310,951, Cl. 24-68.0SK.
Sexton, James H.: *See—*
Masse, Lucien; Medlin, W. Louis; and Sexton, James H., 4,312,049, Cl. 367-35.000.
Shannon, Edward J., Jr. Tree stand. 4,310,989, Cl. 47-40.500.
Sharp Kabushiki Kaisha: *See—*
Fukuda, Hiroaki; Sasaki, Takehiko; and Mori, Hiroshi, 4,311,953, Cl. 320-2.000.
Nakajiri, Takashi, 4,312,018, Cl. 358-261.000.
Tanabe, Takeshi, 4,311,895, Cl. 219-10.55B.
Uede, Hisashi; Inami, Yasuhiko; Hamada, Hiroshi; Hishida, Tadanori; and Nakauchi, Hiroshi, 4,312,000, Cl. 340-785.000.
Shaw, R. Howard: *See—*
Coad, George L.; Shaw, R. Howard; and Hutchinson, Martin A., 4,311,427, Cl. 414-217.000.
Shell Oil Company: *See—*
Davis, Royston H.; and Davies, John H., 4,311,838, Cl. 544-54.000.
Drent, Eit, 4,311,862, Cl. 568-689.000.
Foster, James P.; and Reed, Walter T., 4,310,985, Cl. 43-131.000.
McCullough, J. Douglas, Jr.; and Rhodes, Louis C., 4,311,807, Cl. 525-197.000.
Verschuur, Eke, 4,311,488, Cl. 44-10.00R.
Vogel, Charles B.; and Herolz, Robert A., 4,312,052, Cl. 367-75.000.
Youngman, Edward A.; and Schnell, Russell C., 4,311,517, Cl. 71-121.000.
Sheng, Henry P. Phase separation apparatus. 4,311,590, Cl. 210-360.200.

Shepherd, Robert G., to American Cyanamid Company. 4-[(Monosubstituted-alkyl) amino]benzoic acids and analogs as hypolipidemic and antiatherosclerotic agents. 4,311,846, Cl. 546-226.000.
Sherwood, Donald W.; and Riordan, Daniel T., to Hooker Chemicals & Plastics Corp. Foundry aggregate binders and foundry compositions prepared therefrom. 4,311,620, Cl. 260-9.000.
Sherwood Medical Industries Inc.: *See*—
Gerard, William L., 4,311,137, Cl. 128-214.400.
Sherwood, Richard C.: *See*—
Chin, Gilbert Y.; Green, Martin L.; Sherwood, Richard C.; and Wernick, Jack H., 4,311,537, Cl. 148-108.000.
Shesterkina, Natalya F.: *See*—
Pimenov, Anatoly N.; Putlyaev, Ivan E.; Otrepiev, Vladimir A.; Guzeev, Evgeny A.; Shesterkina, Natalya F.; Paturoev, Vasily V.; and Pankovsky, Dmitry A., 4,311,530, Cl. 106-84.000.
Shida, Masaharu; Torisawa, Akira; and Ueda, Makoto, to Kabushiki Kaisha Daini Seikosha. Electronic watch. 4,312,058, Cl. 368-66.000.
Shida, Masaharu: *See*—
Mandai, Masaaki; Torisawa, Akira; Ueda, Makoto; Asano, Kazuhiro; Shida, Masaharu; and Satoh, Katsuhiko, 4,312,059, Cl. 368-157.000.
Ueda, Makoto; Torisawa, Akira; Otawa, Shuji; Mandai, Masaaki; Shida, Masaharu; and Sato, Katsuhiko, 4,311,947, Cl. 318-696.000.
Shields, George B.: *See*—
Starr, Eugene W.; and Shields, George B., 4,311,507, Cl. 65-114.000.
Shih, David H.: *See*—
Christensen, Burton G.; Leanza, William J.; Shih, David H.; and Wildonger, Kenneth J., 4,311,704, Cl. 424-274.000.
Shimano Industrial Company Limited: *See*—
Sugimoto, Kazuo, 4,311,473, Cl. 474-160.000.
Shimaoka, Goro: *See*—
Kaetsu, Isao; Kumakura, Minoru; Yoshida, Masaru; Shimaoka, Goro; and Urabe, Masanobu, 4,311,732, Cl. 427-164.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, 4,311,828, Cl. 528-483.000.
Shiozaki, Yasumi: *See*—
Yamada, Koichi; Harato, Takuo; Kato, Hisakatsu; and Shiozaki, Yasumi, 4,311,486, Cl. 23-301.000.
Shiraishi, Makoto: *See*—
Moritani, Tohei; Yamauchi, Junnosuke; and Shiraishi, Makoto, 4,311,805, Cl. 525-60.000.
Shirasaka, Hisatoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Function test evaluation apparatus for evaluating a function test of a logic circuit. 4,312,067, Cl. 371-25.000.
Shirts, Monte B.: *See*—
Smith, Gregory E.; Huiatt, Jerry L.; and Shirts, Monte B., 4,311,584, Cl. 209-12.000.
Shumate, Donald L. Pressure-balancing end plate for a reversible gear pump or motor. 4,311,444, Cl. 418-74.000.
Shupert, Paul T., to Allis-Chalmers Corporation. Motor vehicle with resilient cushions between its body and main frame structures. 4,311,204, Cl. 180-54.00R.
Siadat, Bahram, to W. R. Grace & Co. Inomer thermoforming. 4,311,655, Cl. 264-22.000.
Siddi, Giorgio: *See*—
Gozzo, Franco; Abbruzzese, Luigi; and Siddi, Giorgio, 4,311,516, Cl. 71-111.000.
Siebeneichen, Kurt, to Volkswagenwerk Aktiengesellschaft. Installation for applying a layer of a corrosion-inhibiting material. 4,311,112, Cl. 118-408.000.
Sieber, Albrecht: *See*—
Glockler, Otto; Gunther, Dieter; Steinbrenner, Ulrich; Schulzke, Peter; and Sieber, Albrecht, 4,311,123, Cl. 123-325.000.
Siemens Aktiengesellschaft: *See*—
Ahne, Hellmut; Kuhn, Eberhard; Rubner, Roland; and Schmidt, Erwin, 4,311,785, Cl. 430-283.000.
Hacker, Heinz; Aulich, Hubert; Grabmaier, Josef; and Douklias, Nikolaos, 4,311,726, Cl. 427-54.100.
Krumme, Hans-Jochen; and Schmitt, Guenter, 4,311,911, Cl. 250-445.00T.
Mugrauer, Hubert, 4,311,723, Cl. 427-14.100.
Pelkmann, Bernhard; Vogel, Dieter; and Schenkl, Alfred, 4,311,949, Cl. 318-799.000.
Sachs, Bertram, 4,310,957, Cl. 29-25.350.
Schwab, Rolf; and Stralka, Herbert, 4,311,424, Cl. 414-27.000.
Vogel, Klaus, 4,312,072, Cl. 375-1.000.
Sigwalt, Pierre; Guyot, Patrick; and Fontanille, Michel, to Societe Chimique des Charbonnages-Cdf. Chimie; and Agence Nationale de Valorisation de la Recherche (ANVAR). Bi- and Trifunctional organolithium initiators and applications thereof. 4,311,818, Cl. 326-173.000.
Sih, John C., to Upjohn Company, The. 2-Decarboxy-2-tetrazolyl-19-hydroxy-19-methyl-6-oxo-PGF_1 compounds. 4,311,834, Cl. 542-429.000.
Sih, John C., to Upjohn Company, The. 2-Decarboxy-2-tetrazolyl-19-hydroxy-6a-carba-PGI_1 compounds. 4,311,835, Cl. 542-429.000.
Simon, Istvan. Rotary piston machine with alternating pistons and sealings therefor. 4,311,442, Cl. 418-37.000.
Simpson, Elmer J., to Elevator Equipment Co. Valve control system. 4,311,212, Cl. 187-29.00A.
Singer Company, The: *See*—
Gdovin, David P.; and Lusk, Frank J., 4,310,974, Cl. 434-42.000.
Sistare, James R., 4,311,063, Cl. 74-395.000.
SINTEF (Selskapet for industriell og teknisk forskning ved NTH): *See*—
Holand, Bard, 4,312,054, Cl. 367-134.000.
Sistare, James R., to Singer Company, The. Bearing and bearing mount and tools incorporating same. 4,311,063, Cl. 74-395.000.
Sitzmann, Michael E.: *See*—
Gilligan, William H.; and Sitzmann, Michael E., 4,311,649, Cl. 260-455.00A.
Skalatsky, Viktor K.: *See*—
Glushko, Mikhail F.; Skalatsky, Viktor K.; Emelyanov, Vyacheslav G.; Korovainy, Sergei F.; Koroschenko, Mikhail S.; Solomkin, Leonid D.; and Stukalenko, Mikhail I., 4,311,001, Cl. 57-215.000.
Skeist, S. Merrill; and Gross, Leo, to Spellman High Voltage Electronics Corp. Compact fluorescent lamp and method and means for magnetic arc spreading. 4,311,942, Cl. 315-62.000.
Skeist, S. Merrill: *See*—
Gross, Leo; and Skeist, S. Merrill, 4,311,943, Cl. 315-70.000.
Skelly, James K.: *See*—
Price, Ian M.; and Skelly, James K., 4,311,480, Cl. 8-527.000.
SKF Kugellagerfabriken GmbH: *See*—
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; Ernst, Horst M.; and Schido, Friedrich, 4,311,348, Cl. 308-6.00C.
SKF Nova AB: *See*—
Lundgren, Bengt, 4,311,058, Cl. 74-89.000.
Skorianetz, Werner; and Ohloff, Gunther, to Firmenich SA. Oxygen containing derivatives of tricyclo[6.2.1.$0^{2,7}$]undecane. 4,311,852, Cl. 560-256.000.
Skowronski, Michael J.; and DeLeon, Alberto, to Celotex Corporation, The. Polyisocyanurate foam and process therefor. 4,311,801, Cl. 521-110.000.
Skutecki, Edmund R., to Sperry Corporation. Transient free synchronization system. 4,312,039, Cl. 364-434.000.
Slagle, Bernie L. Water injection system for diesel engine. 4,311,118, Cl. 123-25.00A.
Sloan, Kenneth B.: *See*—
Bodor, Nicholas S.; Sloan, Kenneth B.; and Pogany, Stefano A., 4,311,706, Cl. 424-301.000.
Slovinsky, Manuel, to Nalco Chemical Company. Reduced methylene blue for oxygen removal. 4,311,599, Cl. 210-757.000.
Sluys, Wesley W., to Builders Concrete, Inc. Cantilevered finger piers for marine floats. 4,311,413, Cl. 405-219.000.
Small, William M., to Phillips Petroleum Company. Vortex generators. 4,311,187, Cl. 165-1.000.
Smelt, Arthur B.: *See*—
Stoves, Derek; Hawkins, Roger W.; and Smelt, Arthur B., 4,311,167, Cl. 137-454.200.
Smh-Adrex: *See*—
Lange, Francois, 4,312,009, Cl. 346-140.00R.
Smith, Arthur W.; and Gottsche, Marcus J., to Stanadyne, Inc. Fuel injection pump with universal governor plate suspension system. 4,311,125, Cl. 123-364.000.
Smith, Ernest L., to Phillips Petroleum Company. Closure and a package employing the closure. 4,311,238, Cl. 206-508.000.
Smith, Gordon E., to Quest Medical, Inc. Method and apparatus for catheter insertion. 4,311,139, Cl. 128-214.400.
Smith, Gregory E.; Huiatt, Jerry L.; and Shirts, Monte B., to United States of America, Interior. Amine flotation of chromite from acidic pulps. 4,311,584, Cl. 209-12.000.
Smith, James E.: *See*—
Gilligan, Thomas J.; Smith, James E.; and Wong, Yun P., 4,312,048, Cl. 365-195.000.
Smith, James J. Cable and battery terminal cleaner. 4,310,941, Cl. 15-160.000.
Smith, John C.: *See*—
Bower, Lewis R. B.; Scarfe, Arthur; and Smith, John C., 4,311,417, Cl. 405-297.000.
Smith, Karen K.: *See*—
Goulianos, Konstantin; Smith, Karen K.; and White, Sebastian N., 4,311,908, Cl. 250-374.000.
Smith, Polly P.: *See*—
Schreiber, Hinda S.; Lindahl, Eugenie Z.; and Smith, Polly P., 4,311,150, Cl. 128-494.000.
Smith, Richard L.; Farrar, Ralph C.; and Sonnenfeld, Richard J., to Phillips Petroleum Company. Continuous solution polymerization process. 4,311,803, Cl. 525-53.000.
Smits, Karel F. A. A., to Medtronic, Inc. Screw-in lead having lead tip with membrane. 4,311,153, Cl. 128-785.000.
Smollinger, Glenn J., to ESB United States, Inc. Emergency power source. 4,311,920, Cl. 307-66.000.
Snyder, Charles W.; and Weaver, Shirley S., to Snyder Skate Co., Inc. Roller skate. 4,311,319, Cl. 280-11.280.
Snyder Skate Co., Inc.: *See*—
Snyder, Charles W.; and Weaver, Shirley S., 4,311,319, Cl. 280-11.280.
Snyder, Solomon H., to Burroughs Wellcome Co. Assay method and kit. 4,311,685, Cl. 424-1.000.
Societe Anonyme Automobiles Citroen: *See*—
Froumajou, Armand, 4,311,067, Cl. 74-718.000.
Societe Anonyme D.B.A.: *See*—
Guillon, Marcel, 4,311,083, Cl. 91-19.000.
S.A. des Etablissements STAUBLI (France): *See*—
Truchet, Gaston, 4,311,328, Cl. 285-308.000.
Societe Anonyme dite: les Editions Filmees: *See*—
Fort, Francois; and Zimmermann, Pierre, 4,311,501, Cl. 65-3.110.

Societe Anonyme Francaise Du Ferodo: *See—*
Eon, Christian V.; and Dumont, Jean-Pierre M. C., 4,311,051, Cl. 73-517.00R.
Societe Chimique des Charbonnages-Cdf. Chimie: *See—*
Sigwalt, Pierre; Guyot, Patrick; and Fontanille, Michel, 4,311,818, Cl. 326-173.000.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Launay, Noel, 4,311,716, Cl. 426-275.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Roiret, Michel C.; and Salles, Aime M., 4,311,388, Cl. 356-341.000.
Societe Nouvelle de Bouchons Plastiques: *See—*
Babiol, Pierre, 4,311,259, Cl. 222-525.000.
Solar, Serge: *See—*
Demarthe, Jean-Michel; and Solar, Serge, 4,311,676, Cl. 423-10.000.
Solar Suede Corporation: *See—*
Jordan, Richard A., 4,311,113, Cl. 118-629.000.
Soliven, Dante R. Footwear box with handles. 4,311,268, Cl. 229-9.000.
Solloway, Daniel S. Aquatic exercise assembly. 4,311,306, Cl. 272-130.000.
Solomkin, Leonid D.: *See—*
Glushko, Mikhail F.; Skalatsky, Viktor K.; Emelyanov, Vyacheslav G.; Korovainy, Sergei F.; Koroschenko, Mikhail S.; Solomkin, Leonid D.; and Stukalenko, Mikhail I., 4,311,001, Cl. 57-215.000.
Solomon, John. Micro cleanup and concentration apparatus for trace residue analysis by gas liquid chromatography. 4,311,668, Cl. 422-70.000.
Somlyody, Arpad, to Burroughs Corporation. Electrophoretic display using a non-Newtonian fluid as a threshold device. 4,311,361, Cl. 350-267.000.
Sommer, Werner; Schieber, Hans; Krause, Erich; Radel, Franz; Trumper, Werner; Rieche, Henning; Tollkuhn, Dieter; Retallick, David; Weingartner, Albin; and Doslik, Peter R., to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG. Data entry device for a flatbed knitting machine with electronic control. 4,311,029, Cl. 66-75.200.
Sonnenfeld, Richard J.: *See—*
Smith, Richard L.; Farrar, Ralph C.; and Sonnenfeld, Richard J., 4,311,803, Cl. 525-53.000.
Sony Corporation: *See—*
Uedaira, Satoru; Ito, Shigeyasu; Aso, Koichi; and Hayakawa, Masatoshi, 4,311,539, Cl. 148-121.000.
Sorenson Research Co., Inc.: *See—*
Wonder, Terry M., 4,311,146, Cl. 128-325.000.
Southwire Company: *See—*
Berry, Milton E., 4,311,519, Cl. 75-72.000.
Spaccarotella, Antonio. Method for quickly repairing break-outs in continuous casting plants. 4,311,186, Cl. 164-453.000.
Spak, Michael E.: *See—*
Gunter, Thomas G.; Hobbs, Colleen M. E.; Spak, Michael E.; and Tredennick, Harry L., 4,312,034, Cl. 364-200.000.
Spangler, Glenn E., to Bendix Corporation, The. Membrane interface for ion mobility detector cells. 4,311,669, Cl. 422-98.000.
Spellman High Voltage Electronics Corp.: *See—*
Gross, Leo; and Skeist, S. Merrill, 4,311,943, Cl. 315-70.000.
Skeist, S. Merrill; and Gross, Leo, 4,311,942, Cl. 315-62.000.
Spence, Gavin G.: *See—*
Maslanka, William W.; and Spence, Gavin G., 4,311,809, Cl. 525-286.000.
Speranza, Donald: *See—*
Gee, Thomas A.; and Speranza, Donald, 4,311,985, Cl. 340-58.000.
Sperl, Harald: *See—*
Ries, Karl; Hannoschock, Kurt; Rozic, Krsto-Marijan; Basler, Gunter; Sperl, Harald; and Weinschenk, Kurt, 4,311,905, Cl. 250-321.000.
Sperry Corporation: *See—*
Howell, Robert M., 4,311,282, Cl. 241-56.000.
Kinzie, George R., 4,311,995, Cl. 340-684.000.
Skutecki, Edmund R., 4,312,039, Cl. 364-434.000.
Spichala, Paul: *See—*
Heyer, Gunther; Kany, Karl; Spichala, Paul; Wossner, Felix; and Wecker, Wilhelm, 4,311,302, Cl. 267-64.230.
Sprague, Peter W.: *See—*
Moniot, Jerome L.; Fox, Rita T.; Sprague, Peter W.; and Haslanger, Martin F., 4,311,644, Cl. 260-346.220.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. Use of 2,4,6-trimethylcyclohexanemethanol derivatives in augmenting or enhancing the aroma of dryer-added fabric softener articles. 4,311,602, Cl. 252-8.600.
Sprecker, Mark A., to International Flavors & Fragrances Inc. Norbornyl ethers. 4,311,861, Cl. 568-659.000.
Spriggs, William A. Method for repairing extensive damage to plasterboard wall areas. 4,311,656, Cl. 264-36.000.
Spycher, Anton A.; and Damico, Dennis J., to Corning Glass Works. Plastic components of improved hardness and scratch resistance. 4,311,762, Cl. 428-412.000.
Stair, Virgil H.: *See—*
Evenson, Dale D.; and Stair, Virgil H., 4,310,970, Cl. 30-276.000.
Stana, Regis R.; Mitchell, Edward; Rudolph, Joseph S.; and Lopez, Jose G., to Westinghouse Electric Corp. Maintaining reductive strip efficiency in uranium recovery processes. 4,311,675, Cl. 423-8.000.
Stanadyne, Inc.: *See—*
Smith, Arthur W.; and Gottsche, Marcus J., 4,311,125, Cl. 123-364.000.
Standard Oil Company (Indiana): *See—*
Boone, David E.; and Jezl, James L., 4,311,612, Cl. 252-429.00B.
Harper, Jon J.; and Pietsch, Stephen J., 4,311,521, Cl. 75-101.0BE.
Lucas, Robert C., 4,312,050, Cl. 367-44.000.
Weisrock, William P., 4,311,796, Cl. 435-104.000.
Standley, Paul M., to Dayco Corporation. Synchronous belt and method for making the same. 4,311,474, Cl. 474-205.000.
Stang, Louis G., to United States of America, Energy. Wet powder seal for gas containment. 4,311,409, Cl. 405-52.000.
Stanwood, David A.: *See—*
Baker, John C.; Finley, Richard O.; Stanwood, David A.; and Bryson, Robert C., 4,310,946, Cl. 15-363.000.
Starch, Michael S., to Dow Corning Corporation. Personal-care emulsions comprising a siloxane-oxyalkylene copolymer. 4,311,695, Cl. 424-184.000.
Starr, Eugene W.; and Shields, George B., to PPG Industries, Inc. Special entrance slit module and method for quenching glass sheets. 4,311,507, Cl. 65-114.000.
Staszewski, Rafal: *See—*
Zaremba, Marek; Rozycki, Czeslaw; and Staszewski, Rafal, 4,311,664, Cl. 422-54.000.
Statnetics Laboratories Corp.: *See—*
Crownover, Joseph W., 4,311,455, Cl. 432-18.000.
Stauffer Chemical Company: *See—*
Abramson, Alan; and Weil, Edward D., 4,311,652, Cl. 260-969.000.
Stebco Industries, Inc.: *See—*
Stein, Edward B., 4,311,223, Cl. 190-51.000.
Steel, Margaret L.: *See—*
Cowen, Geoffrey; Norton-Berry, Philip; and Steel, Margaret L., 4,311,570, Cl. 204-157.10R.
Steffen, Lisle J. Braking device for use with climbing lines. 4,311,218, Cl. 188-65.400.
Steidinger, Donald J., to Wallace Business Forms, Inc. Method of making a continuous web form and product, particularly one suitable for airline ticketing. 4,311,325, Cl. 282-11.50A.
Steiger, Rolf; and Reber, Jean F., to Ciba-Geigy AG. Novel sensitizers and their use in direct-positive photographic materials. 4,311,786, Cl. 430-411.000.
Steilen, Ronald M.; and Schreiner, Lester D., to Deere & Company. Press grain drill. 4,311,104, Cl. 111-85.000.
Stein, Edward B., to Stebco Industries, Inc. Bowling bag. 4,311,223, Cl. 190-51.000.
Steinberg, Hans: *See—*
Hiersig, Heinz M.; and Steinberg, Hans, 4,311,472, Cl. 440-75.000.
Steinbrenner, Ulrich: *See—*
Glockler, Otto; Gunther, Dieter; Steinbrenner, Ulrich; Schulzke, Peter; and Sieber, Albrecht, 4,311,123, Cl. 123-325.000.
Stelzer, Clarence F., Jr.: *See—*
Ortloff, John E.; Stelzer, Clarence F., Jr.; and Hayes, Donald R., 4,311,327, Cl. 285-136.000.
Stephenson, James E.: *See—*
Cole, Robert; and Stephenson, James E., 4,311,855, Cl. 564-12.000.
Stern, Larry, to American Printers & Lithographers, Inc. Advertising and promotional display materials. 4,310,978, Cl. 40-600.000.
Sternberg, Henry. Spring for dispenser cover. 4,311,251, Cl. 221-24.000.
Sterzer, Fred; and Paglione, Robert W., to RCA Corporation. Nonsymmetrical bulb applicator for hyperthermic treatment of the body. 4,311,154, Cl. 128-804.000.
Stevens, Edward P.; and Zabel, Jack H., to General Electric Company. Footrest for an x-ray table. 4,310,935, Cl. 5-80.000.
Stevenson, William G.: *See—*
Menzies, Murray A.; and Stevenson, William G., 4,311,119, Cl. 123-80.0BB.
Stewart, Daniel R.; and Heinicke, Joachim H., to AMAX Inc. Core sample orientation tool. 4,311,201, Cl. 175-44.000.
Stewart, Douglas E., to Marconi Company Limited. Combined radar and infrared scanning antenna. 4,312,002, Cl. 343-725.000.
Stiefel, Peter: *See—*
Peters, Klaus-Jurgen; Stiefel, Peter; and Ehrentraut, Heinz, 4,311,168, Cl. 137-549.000.
Stockman, Robert M., to American Radionic Co., Inc. Multiple capacitor winding with electrostatic shielding. 4,312,027, Cl. 361-329.000.
Stofen, Kenneth A. Compressed air system. 4,311,439, Cl. 417-313.000.
Stoves, Derek; Hawkins, Roger W.; and Smelt, Arthur B., to British Gas Corporation. Regulator installation for fluid transmission or distribution systems. 4,311,167, Cl. 137-454.200.
Stralka, Herbert: *See—*
Schwab, Rolf; and Stralka, Herbert, 4,311,424, Cl. 414-27.000.
Stratman, Jerome F., to Tappan Company. Food waste disposer mounting assembly. 4,310,933, Cl. 4-286.000.
Stratton, John F., to Lucas Industries Limited. Fuel injector. 4,311,277, Cl. 239-400.000.
Stratton, Richard L., to Dyna-Tech Corp. Electro-optical presence detection scanner. 4,311,915, Cl. 250-561.000.
Strauss, Edward. Smoking elimination guidance system. 4,311,448, Cl. 431-14.000.
Streicher, Paul. Two point hitch construction. 4,310,997, Cl. 56-15.900.
Strickman, Melvyn B.: *See—*
Strickman, Robert L.; Fournier, Erick-Pierre; and Strickman, Melvyn B., 4,311,543, Cl. 156-224.000.
Strickman, Robert L.; Fournier, Erick-Pierre; and Strickman, Melvyn B. Method of manufacturing a disposable contraceptive intravaginal cervical barrier. 4,311,543, Cl. 156-224.000.

Strobel, Felix, to Mettler Instrumente AG. Multisegment liquid crystal indication system. 4,311,993, Cl. 340-641.000.
Strong, Walter C.: *See*—
Irvin, Dee L.; and Strong, Walter C., 4,310,983, Cl. 43-17.000.
Stukalenko, Mikhail I.: *See*—
Glushko, Mikhail F.; Skalatsky, Viktor K.; Emelyanov, Vyacheslav G.; Korovainy, Sergei F.; Koroschenko, Mikhail S.; Solomkin, Leonid D.; and Stukalenko, Mikhail I., 4,311,001, Cl. 57-215.000.
Stukenberg, John R.: *See*—
Benjes, Henry H.; Wahbeh, Valery N.; and Stukenberg, John R., 4,311,593, Cl. 210-603.000.
Stump, Charles W.: *See*—
Freeman, E. Thomas; Stump, Charles W.; and Dreisbach, Francis W., 4,311,378, Cl. 354-217.000.
Stump, Theodore M.: *See*—
Bench, Stephen M.; Thibodeau, Paul H.; Campbell, Guy M.; and Stump, Theodore M., 4,312,064, Cl. 370-71.000.
Styring, Ralph E., Jr., to Atlantic Richfield Company. Separating carbon dioxide and ethane by liquid-liquid extraction. 4,311,495, Cl. 62-17.000.
Su, Chung-Sin, to Union Carbide Canada Limited. Cling film composition of olefin polymer blend. 4,311,808, Cl. 525-222.000.
Subcom, Inc.: *See*—
Lipsky, Alan H., 4,312,053, Cl. 367-127.000.
Suga, Goro. Dentures. 4,311,462, Cl. 433-184.000.
Suga, Masaaki: *See*—
Hamada, Hideo; and Suga, Masaaki, 4,311,062, Cl. 74-333.000.
Sugano, Kazuo: *See*—
Hiki, Toshio; and Sugano, Kazuo, 4,311,401, Cl. 400-248.000.
Sugarman, Edward D. Illuminated hypodermic needle. 4,311,138, Cl. 128-214.400.
Sugimoto, Kazuo, to Shimano Industrial Company Limited. Retaining device for a multi-stage sprocket assembly. 4,311,473, Cl. 474-160.000.
Sugiura, Hiroaki: *See*—
Saito, Tadao; Akutsu, Masao; Sugiura, Hiroaki; and Endo, Shuzo, 4,311,246, Cl. 215-100.00A.
Sukeshita, Kazumi, to Nissan Motor Co., Ltd. Transmission operating device. 4,311,064, Cl. 74-473.00R.
Sullivan, Thomas A.: *See*—
McBee, William C.; and Sullivan, Thomas A., 4,311,826, Cl. 528-389.000.
Suman, George O. Well packer. 4,311,314, Cl. 277-34.000.
Sumida, Heiji: *See*—
Ishizaka, Mitsuo; and Sumida, Heiji, 4,311,737, Cl. 427-386.000.
Sumitomo Aluminium Smelting Company, Limited: *See*—
Yamada, Koichi; Harato, Takuo; Kato, Hisakatsu; and Shiozaki, Yasumi, 4,311,486, Cl. 23-301.000.
Sumitomo Chemical Company Limited: *See*—
Imai, Shozaburo; Suzuki, Haruo; Asai, Kuniaki; and Ueno, Katsuji, 4,311,823, Cl. 528-181.000.
Sun Electric Corporation: *See*—
Frank, Howard; Swafford, John W., Jr.; Farazi, Perry; Patel, Arvind M.; Chan, Cheuk-Wah; Dohnal, Edward J.; Wang, Clark S.; and Mehta, Ashokkumar D., 4,312,043, Cl. 364-551.000.
Sunds Defibrator AB: *See*—
Akerlund, Sven G.; and Hook, Jan-Erik, 4,311,553, Cl. 162-23.000.
Sundstrand Corporation: *See*—
Olson, Raymond N., 4,311,932, Cl. 310-61.000.
Sundstrand Data Control, Inc.: *See*—
Bateman, Charles D., 4,312,042, Cl. 364-463.000.
Sundstrom, Erik W., to Sanvik Aktiebolag. Cutting tool. 4,311,075, Cl. 83-848.000.
Sung, Pei. γ2 - Free, low cost amalgam alloy powders. 4,311,526, Cl. 75-255.000.
Supcoe, Robert F., to United States of America, Navy. Blue-gray low infrared emitting coating. 4,311,623, Cl. 260-18.00S.
Superior, S.A.: *See*—
Cas:anier, Philippe, 4,311,222, Cl. 190-18.00A.
Superior Stainless, Inc.: *See*—
Welch, Elmer S., 4,311,164, Cl. 137-315.000.
Supp, Armin: *See*—
Auerbach, Horst; Nebe, Rainer; and Supp, Armin, 4,311,240, Cl. 209-169.000.
Sutton, Gordon W., to British Petroleum Company Limited, The. Nozzle injection unit. 4,311,278, Cl. 239-419.300.
Suzuki, Haruo: *See*—
Imai, Shozaburo; Suzuki, Haruo; Asai, Kuniaki; and Ueno, Katsuji, 4,311,823, Cl. 528-181.000.
Suzuki, Tadashi, to Sato Gosei Co., Ltd. Method of and apparatus for attaching connecting pieces. 4,310,962, Cl. 29-417.000.
Suzuki, Toshitaka: *See*—
Iwamoto, Taro; Ando, Shimon; Kusumoto, Sho; Omae, Tsutomu; Suzuki, Toshitaka; Takidera, Masatake; Koyama, Takaichi; Hamada, Kunio; and Yoshida, Kazuhiro, 4,311,556, Cl. 376-249.000.
Svoboda, Josef, to TMC Corporation. Ski binding. 4,311,321, Cl. 280-611.000.
Swafford, Jerry W.: *See*—
Crockett, Charles R.; and Swafford, Jerry W., 4,311,978, Cl. 336-92.000.
Swafford, John W., Jr.: *See*—
Frank, Howard; Swafford, John W., Jr.; Farazi, Perry; Patel, Arvind M.; Chan, Cheuk-Wah; Dohnal, Edward J.; Wang, Clark S.; and Mehta, Ashokkumar D., 4,312,043, Cl. 364-551.000.
Sweeney, James S.; and Sweeney, James S., Jr. Digital motor control for positioning system. 4,312,033, Cl. 364-167.000.
Sweeney, James S., Jr.: *See*—
Sweeney, James S.; and Sweeney, James S., Jr., 4,312,033, Cl. 364-167.000.
Swenson, Robert. Disposable scroll holder. 4,310,977, Cl. 40-518.000.
Swidwa, Kenneth J.: *See*—
Kowalski, Edward F.; Swidwa, Kenneth J.; and Hornak, Leonard P., 4,311,557, Cl. 376-271.000.
Swiss Aluminium Ltd.: *See*—
Gerunda, Arthur B.; and Goers, Walter E., 4,311,677, Cl. 423-18.000.
Sybron Corporation: *See*—
Yasui, Tadashi; Nakamura, Isamu; and Goto, Shigeo, 4,311,505, Cl. 65-43.000.
Sycor, Inc.: *See*—
Wegryn, William; and Velazquez, Juan F., 4,311,399, Cl. 400-76.000.
Sykes, Donald J., to Philip A. Hunt Chemical Corp. Composition and method for etching copper substrates. 4,311,551, Cl. 156-640.000.
Synthelabo: *See*—
Manoury, Philippe M. J.; Cavero, Icilio A. G.; Najer, Henry; and Giudicelli, Don P. R. L., 4,311,708, Cl. 424-330.000.
Systron Donner Corporation: *See*—
Madni, Asad M., 4,311,997, Cl. 340-722.000.
Szczepanski, Henry; Rohr, Otto; and Rempfler, Hermann, to Ciba-Geigy Corporation. Sulfur-containing alkanecarboxylic acid derivatives with herbicidal and plant growth-regulating action, production thereof and method of use. 4,311,514, Cl. 71-94.000.
Tabuchi, Seigo, to Itoh Iron & Steel Works Co. Ltd. Method of soaking steel pieces. 4,311,454, Cl. 432-11.000.
Taconite Engineering & Manufacturing Co.: *See*—
Hnatko, Karl J., 4,311,242, Cl. 209-668.000.
Taillebois, Jacques A. J., to M.C.B. Validity check process for data supplied by digital displacement detectors and detectors using this process. 4,311,987, Cl. 340-347.00P.
Takada, Kazuo: *See*—
Ueno, Tamotsu; Takahashi, Takehiko; Takada, Kazuo; Hidaka, Toshio; and Takagawa, Makoto, 4,311,868, Cl. 585-747.000.
Takada, Shunji: *See*—
Mifune, Hiroyuki; Takada, Shunji; Akimura, Yoshitaka; and Sakai, Nobuo, 4,311,781, Cl. 430-264.000.
Takada, Yamato: *See*—
Itakura, Gen; Kuramitsu, Hideki; Takada, Yamato; Kuroda, Takayuki; and Irie, Yoshio, 4,311,729, Cl. 427-80.000.
Takagawa, Makoto; Ueno, Tamotsu; and Takahashi, Takehiko, to Mitsubishi Gas Chemical Company, Inc. Process for isomerizing hydrocarbons. 4,311,867, Cl. 585-736.000.
Takagawa, Makoto: *See*—
Ueno, Tamotsu; Takahashi, Takehiko; Takada, Kazuo; Hidaka, Toshio; and Takagawa, Makoto, 4,311,868, Cl. 585-747.000.
Takagi, Masatomo; Hagawa, Takanori; Takamatsu, Seietsu; and Ookoshi, Isao, to Tokyo Shibaura Denki Kabushiki Kaisha. Handle operating mechanism for use with an electric circuit breaker. 4,311,887, Cl. 200-42.00T.
Takahashi, Masashi: *See*—
Yasuhara, Kiyotada; Takahashi, Masashi; Murakami, Ryoichi; and Senzaki, Takashi, 4,311,535, Cl. 148-6.15Z.
Takahashi, Sankichi: *See*—
Matsuzaki, Harumi; Kuroda, Osamu; Okouchi, Isao; Izumi, Kenkichi; and Takahashi, Sankichi, 4,311,575, Cl. 204-180.00P.
Takahashi, Takehiko: *See*—
Takagawa, Makoto; Ueno, Tamotsu; and Takahashi, Takehiko, 4,311,867, Cl. 585-736.000.
Ueno, Tamotsu; Takahashi, Takehiko; Takada, Kazuo; Hidaka, Toshio; and Takagawa, Makoto, 4,311,868, Cl. 585-747.000.
Takamatsu, Seietsu: *See*—
Takagi, Masatomo; Hagawa, Takanori; Takamatsu, Seietsu; and Ookoshi, Isao, 4,311,887, Cl. 200-42.00T.
Takami, Katsumi; Ito, Yoshitoshi; Ishimatsu, Kenji; and Tanaka, Eiichi, to Hitachi Medical Corporation; and National Institute of Radiological Sciences. Radiation detector having refractive index matching means. 4,311,907, Cl. 250-368.000.
Takato, Masao: *See*—
Imai, Masumi; Takato, Masao; and Furuhashi, Toshio, 4,312,038, Cl. 364-431.120.
Takeda, Kunihiko: *See*—
Miyake, Tetsuya; Takeda, Kunihiko; and Ikeda, Akihiko, 4,311,799, Cl. 521-31.000.
Takeno, Hidekazu: *See*—
Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Imanaka, Hiroshi; Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; and Hashimoto, Masashi, 4,311,640, Cl. 260-112.50R.
Takidera, Masatake: *See*—
Iwamoto, Taro; Ando, Shimon; Kusumoto, Sho; Omae, Tsutomu; Suzuki, Toshitaka; Takidera, Masatake; Koyama, Takaichi; Hamada, Kunio; and Yoshida, Kazuhiro, 4,311,556, Cl. 376-249.000.
Talon, Inc.: *See*—
Clearwater, Russell A., 4,310,961, Cl. 29-408.000.
Tam, Hak W.: *See*—
Modes, Vernon E.; Tam, Hak W.; Quinton, Wayne E.; Bailey, Alan G.; Niskanen, Robert A.; Vitez, Lou; and DeBardi, Gary A., 4,311,152, Cl. 128-641.000.

Tamura, Hideo: *See—*
Abe, Sigeharu; Tamura, Hideo; and Murakami, Takayuki, 4,311,546, Cl. 156-643.000.

Tamura, Koichi: *See—*
Haraikawa, Tetsuo; and Tamura, Koichi, 4,311,214, Cl. 188-1.110.

Tanabe, Takeshi, to Sharp Kabushiki Kaisha. Cooking utensil controlled by gas sensor output. 4,311,895, Cl. 219-10.55B.

Tanaka, Eiichi: *See—*
Takami, Katsumi; Ito, Yoshitoshi; Ishimatsu, Kenji; and Tanaka, Eiichi, 4,311,907, Cl. 250-368.000.

Tanaka, Hirokazu: *See—*
Kuroda, Yoshio; Iguchi, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Imanaka, Hiroshi; Kitaura, Yoshihiko; Nakaguchi, Osamu; Hemmi, Keiji; Aratani, Matsuhiko; Takeno, Hidekazu; Okada, Satoshi; Tanaka, Hirokazu; and Hashimoto, Masashi, 4,311,640, Cl. 260-112.50R.

Tanaka, Tetsuo: *See—*
Kubo, Keishi; and Tanaka, Tetsuo, 4,311,750, Cl. 428-212.000.

Tanida, Takeyoshi, to New Nippon Electric Company, Ltd. Pre-setting fine tuning device for a turret type television tuner. 4,311,056, Cl. 74-10.850.

Tanin-Shakhov, Vladilen S.: *See—*
Lebedev, Vladimir M.; Dynchik, Yan G.; Kosarev, Nikolai T.; Tanin-Shakhov, Vladilen S.; and Tarasov, Vladimir S., 4,311,200, Cl. 172-826.000.

Tappan Company: *See—*
Stratman, Jerome F., 4,310,933, Cl. 4-286.000.

Tarasov, Vladimir S.: *See—*
Lebedev, Vladimir M.; Dynchik, Yan G.; Kosarev, Nikolai T.; Tanin-Shakhov, Vladilen S.; and Tarasov, Vladimir S., 4,311,200, Cl. 172-826.000.

Tarco Incorporated: *See—*
Hastings, Larry W., 4,311,561, Cl. 196-14.520.

Tarneja, Krishan S.: *See—*
Bartko, John; Tarneja, Krishan S.; Chu, Chang K.; and Schlegel, Earl S., 4,311,534, Cl. 148-1.500.

Taub, Howard H.; and Wolf, Peter H., to Dataproducts Corporation. Impulse jet head using etched silicon. 4,312,008, Cl. 346-140.00R.

Taubenblat, Pierre W.: *See—*
Batra, Ravi; and Taubenblat, Pierre W., 4,311,522, Cl. 75-153.000.

Taylor, David L., to Harris Corporation. Method of making junction isolated bipolar device in unisolated IGFET IC. 4,311,532, Cl. 148-1.500.

Taylor, David L., to Harris Corporation. Vertical fuse and method of fabrication. 4,312,046, Cl. 365-104.000.

Taylor, Dennis O.: *See—*
Reid, David L.; and Taylor, Dennis O., 4,311,041, Cl. 73-117.300.
Reid, David L.; and Taylor, Dennis O., 4,311,043, Cl. 73-119.00A.

Taylor, Larry T.: *See—*
United States of America, National Aeronautics and Space Administration; Taylor, Larry T.; St. Clair, Anne K.; Carver, Vicki C.; and Furtsch, Thomas A., 4,311,615, Cl. 252-514.000.

Tazuma, James J.: *See—*
Frech, Kenneth J.; and Tazuma, James J., 4,311,680, Cl. 423-230.000.

TDK Electronics Co., Ltd.: *See—*
Iwaya, Shoichi; and Masujima, Sho, 4,312,026, Cl. 361-321.000.
Umeki, Shinji, 4,311,684, Cl. 423-632.000.

Tea, Frank C., to American Baler Company, The. Low-profile vertical baling machine. 4,311,092, Cl. 100-214.000.

Teccor Electronics, Inc.: *See—*
Crockett, Charles R.; and Swafford, Jerry W., 4,311,978, Cl. 336-92.000.

Tega, Ezio, to Emmegizeta Metalmeccanica Gori & Zucchi M.G.Z. S.p.A. Machine for the formation of chains with links of two types. 4,311,003, Cl. 59-16.000.

Telecommunications Radioelectriques et Telephoniques: *See—*
Bellanger, Maurice G.; and Daguet, Jacques L., 4,312,062, Cl. 370-50.000.

Teledyne Industries, Inc.: *See—*
Barbeau, Dennis E., 4,311,431, Cl. 415-172.00A.

Teletype Corporation: *See—*
DeBoo, Jerome L.; and Geis, David G., 4,311,065, Cl. 74-571.00M.

Tellefsen, William J.: *See—*
Myers, Marion M.; and Tellefsen, William J., 4,311,631, Cl. 260-38.000.

Tennant Company: *See—*
Kroll, Harley E.; and Thomsen, Donald L., 4,310,944, Cl. 15-346.000.

Tenneco Chemicals, Inc.: *See—*
Bellettiere, Samuel J.; Hurley, Raymond; and Hoch, Samuel, 4,311,625, Cl. 260-22.00R.
Nicoll, Frank D., 4,311,658, Cl. 264-175.000.

Tenniswood, David M., to McGraw-Edison Company. Rolling conductor supports. 4,311,293, Cl. 248-49.000.

Terraspace, Inc.: *See—*
Cooley, William C., 4,311,343, Cl. 299-22.000.

Terry, Lynn E.; and Schoeppel, Roger J. Power cycles based upon cyclical hydriding and dehydriding of a material. 4,311,014, Cl. 60-649.000.

Teshima, Takashi: *See—*
Miyakawa, Nobuhiro; and Teshima, Takashi, 4,311,779, Cl. 430-107.000.

Teske, Lothar. System for reclaiming bulk solids from a storage pile. 4,311,426, Cl. 414-133.000.

Texaco, Inc.: *See—*
Woodle, Robert A., 4,311,583, Cl. 208-312.000.

Texas Instruments Incorporated: *See—*
Kushida, Osami, 4,311,653, Cl. 261-39.00A.
Noble, Robert T., 4,312,055, Cl. 368-29.000.
Ulug, Mehmet E., 4,312,065, Cl. 370-94.000.

Textron, Inc.: *See—*
Upton, Hubert W.; and Goodman, James R., 4,311,999, Cl. 340-755.000.

Th. Goldschmidt AG: *See—*
Weitemeyer, Christian; and Koerner, Gotz, 4,311,821, Cl. 528-15.000.

Thabet, Pierre J., to Construction Murox, Inc. Structural panel. 4,310,992, Cl. 52-309.110.

Thal, Heinz: *See—*
Eimer, Klaus; Thal, Heinz; and Mindel, Dieter, 4,311,591, Cl. 210-405.000.

Themmes, Lawrence J.: *See—*
Blanchard, Jeffrey R.; and Themmes, Lawrence J., 4,311,889, Cl. 200-52.00R.

Thibodeau, Paul H.: *See—*
Bench, Stephen M.; Thibodeau, Paul H.; Campbell, Guy M.; and Stump, Theodore M., 4,312,064, Cl. 370-71.000.

Thomas, Joyce K.: *See—*
Schaefer, Harold W.; Thomas, Joyce K.; and Hohulin, Samuel E., 4,311,493, Cl. 55-369.000.

Thompson, Glen L.; and Way, Joe W., Jr., to Gifford-Hill & Company, Inc. Trapped-axle conveyor roll. 4,311,226, Cl. 193-35.00R.

Thompson, Neil E. S.; and Oude Alink, Bernardus A., to Petrolite Corporation. Process of preparing hexahydropyrimidines. 4,311,841, Cl. 544-231.000.

Thomsen, Donald L.: *See—*
Kroll, Harley E.; and Thomsen, Donald L., 4,310,944, Cl. 15-346.000.

Thomson CSF: *See—*
Benoit, Michel; Gerlach, Pierre; Grolleau, Claude; and Lartillot, Alain, 4,311,975, Cl. 333-207.000.
Bert, Alain; Kaminsky, Didier; and Kantorowicz, Gerard, 4,311,966, Cl. 330-286.000.
Bert, Alain; and Le Clerc, Bernard, 4,311,970, Cl. 331-107.00R.
Clavelloux, Noel; and Peynaud, Francois, 4,311,045, Cl. 73-170.00A.
Fay, Bernard; Trotel, Jacques; and Frichet, Alain, 4,311,389, Cl. 356-354.000.
Felix, Pierre; and Le Parquier, Guy, 4,311,906, Cl. 250-349.000.
Matherat, Philippe, 4,311,998, Cl. 340-731.000.
Roche, Marcel, 4,311,533, Cl. 148-1.500.

Thoratec Laboratories Corporation: *See—*
Robinson, Thomas C., 4,311,133, Cl. 128-1.00D.

Tibbetts, Samuel H.: *See—*
Brown, Peter S.; and Tibbetts, Samuel H., 4,311,028, Cl. 64-28.00R.

Tietjens, Eduard W.: *See—*
Buik, Dirk A.; and Tietjens, Eduard W., 4,310,968, Cl. 30-34.200.

Tinch, David H.; Carpenter, Bruce N.; and Eliahou, Elie S., to Schlumberger Limited. Well log depth aligning. 4,312,040, Cl. 364-422.000.

Titsworth, Jerry M., to Bendix Corporation, The. Variable frequency missing pulse detector. 4,311,962, Cl. 328-120.000.

Titus, Timothy C., to Wells Manufacturing Corporation. Band saw blade tightening device. 4,311,074, Cl. 83-816.000.

Titus, Wanda L. Organizer jewelry box. 4,311,235, Cl. 206-483.000.

TMC Corporation: *See—*
Svoboda, Josef, 4,311,321, Cl. 280-611.000.

Tobin, Curtis L.; and Ciarlei, Joseph A., to Carrier Corporation. Combination reversing valve and expansion device for a reversible refrigeration circuit. 4,311,020, Cl. 62-324.600.

Todaka, Hironori: *See—*
Fujii, Masaki; Miyabayashi, Mitsutaka; Todaka, Hironori; and Ishizaki, Yoshihiro, 4,311,810, Cl. 525-321.000.

Tokico Ltd.: *See—*
Haraikawa, Tetsuo; and Tamura, Koichi, 4,311,214, Cl. 188-1.110.

Tokunaga, Takeshi: *See—*
Tsubaki, Toshio; Tokunaga, Takeshi; Yonekura, Seiji; Matsuoka, Shigeru; Miura, Makoto; and Yamauchi, Kozi, 4,311,225, Cl. 192-142.00R.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Akino, Morio; Yanagida, Seiichi; and Yamashita, Hiroshi, 4,311,286, Cl. 242-55.19A.
Kudor, Toshiaki, 4,312,031, Cl. 363-41.000.
Shirasaka, Hisatoshi, 4,312,067, Cl. 371-25.000.
Takagi, Masatomo; Hagawa, Takanori; Takamatsu, Seietsu; and Ookoshi, Isao, 4,311,887, Cl. 200-42.00T.

Tollkuhn, Dieter: *See—*
Sommer, Werner; Schieber, Hans; Krause, Erich; Radel, Franz; Trumper, Werner; Rieche, Henning; Tollkuhn, Dieter; Retallick, David; Weingartner, Albin; and Doslik, Peter R., 4,311,029, Cl. 66-75.200.

Tolmie, Robert J., Jr., to Pitney Bowes Inc. Zero crossing phase fired controller. 4,311,956, Cl. 323-300.000.

Tonooka, Isao: *See—*
Ozaki, Sozaburo; and Tonooka, Isao, 4,311,936, Cl. 310-242.000.

Toray Industries, Inc.: *See—*
Saito, Takeshi; Ueno, Takashi; and Kashiwagi, Hideo, 4,311,368, Cl. 351-165.000.

Toray Silicone Company, Ltd.: *See—*
Ona, Isao; Ozaki, Masaru; and Usui, Katsutoshi, 4,311,626, Cl. 260-29.20M.

Torisawa, Akira: *See—*
Mandai, Masaaki; Torisawa, Akira; Ueda, Makoto; Asano, Kazuhiro; Shida, Masaharu; and Satoh, Katsuhiko, 4,312,059, Cl. 368-157.000.
Shida, Masaharu; Torisawa, Akira; and Ueda, Makoto, 4,312,058, Cl. 368-66.000.
Ueda, Makoto; Torisawa, Akira; Otawa, Shuji; Mandai, Masaaki; Shida, Masaharu; and Sato, Katsuhiko, 4,311,947, Cl. 318-696.000.
Toudo, Kenzi; Miyanaka, Motoshi; Saeki, Ikuo; and Nakaoka, Yosiaki, to Hitachi, Ltd. Electric corrosion preventing apparatus. 4,311,576, Cl. 204-196.000.
Towers, Christine M.: *See—*
Luckey, George W.; and Towers, Christine M., 4,311,487, Cl. 23-305.0RE.
Toy, Malcolm D. Garment display rack. 4,311,260, Cl. 223-63.000.
Toyo Engineering Corp.: *See—*
Inoue, Shigeru; Ono, Hiroshi; Fukui, Akito; and Morikawa, Haruyuki, 4,311,856, Cl. 564-67.000.
Toyo Kogyo Co., Ltd.: *See—*
Watanabe, Kinji, 4,311,744, Cl. 428-83.000.
Toyo Seikan Kaisha, Ltd.: *See—*
Otsuka, Yoshiaki, 4,311,742, Cl. 428-35.000.
Toyoda Koki Kabushiki Kaisha: *See—*
Narumi, Tadataka; and Sato, Akihiko, 4,311,161, Cl. 137-117.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Kawaguchi, Hiroshi; and Sanayama, Masaki, 4,311,060, Cl. 74-142.000.
Tracor, Inc.: *See—*
Baldwin, Lawrence G.; Ehrlich, Burney J.; and Dixon, Jack B., 4,311,586, Cl. 210-101.000.
Trail Manufacturing Limited: *See—*
Asberg, Gary J.; Wickman, Klaus; and Reid, David, 4,310,972, Cl. 30-382.000.
Tredennick, Harry L.: *See—*
Gunter, Thomas G.; Hobbs, Colleen M. E.; Spak, Michael E.; and Tredennick, Harry L., 4,312,034, Cl. 364-200.000.
Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. Process for hydrogenation of 2,6,6-trimethyl cyclohexene derivatives and organoleptic uses of said products. 4,311,754, Cl. 428-284.000.
Tribolet, Herbert. Vacuum extraction recovery system assembly. 4,310,945, Cl. 15-347.000.
Trietley, Harry L., Jr., to Yellow Springs Instrument Company, Inc., The. Trimmable wirewound resistance temperature transducer. 4,311,982, Cl. 338-195.000.
Trimble, David C.: *See—*
Berkowitz, Paul R.; Quinn, Thomas M.; Trimble, David C.; and Wang, Tse L., 4,311,878, Cl. 179-16.0EC.
Trotel, Jacques: *See—*
Fay, Bernard; Trotel, Jacques; and Frichet, Alain, 4,311,389, Cl. 356-354.000.
Truchet, Gaston, to S.A. des Etablissements STAUBLI (France). Rapid fitting devices for joining pipes. 4,311,328, Cl. 285-308.000.
True Temper Corporation: *See—*
Marsh, Ronald P., 4,311,273, Cl. 238-1.000.
Trumper, Werner: *See—*
Sommer, Werner; Schieber, Hans; Krause, Erich; Radel, Franz; Trumper, Werner; Rieche, Henning; Tollkuhn, Dieter; Retallick, David; Weingartner, Albin; and Doslik, Peter R., 4,311,029, Cl. 66-75.200.
TRW, Inc.: *See—*
Merz, Kenneth M., 4,311,048, Cl. 73-293.000.
Roberts, Maurice P., 4,311,171, Cl. 137-625.230.
Tsubaki, Toshio; Tokunaga, Takeshi; Yonekura, Seiji; Matsuoka, Shigeru; Miura, Makoto; and Yamauchi, Kozi, to Hitachi, Ltd. Device for driving driven member by roller chain. 4,311,225, Cl. 192-142.00R.
Tsuchiya, Hidetaka; and Nakajima, Kouichi, to Citizen Watch Co., Ltd. Push button assembly. 4,311,893, Cl. 200-340.000.
Tsuda, Hiroshi; and Adachi, Masahiro, to Nissan Motor Company, Limited. Meter for vehicles. 4,311,365, Cl. 350-399.000.
Tsunematsu, Hiroshi: *See—*
Kuribayashi, Tetsuzo; and Tsunematsu, Hiroshi, 4,311,013, Cl. 60-646.000.
Tubbs, Joseph T.: *See—*
Funcik, Jack F.; Bennet, Joseph C.; Tubbs, Joseph T.; and Schneider, Thomas E., 4,310,967, Cl. 29-749.000.
Tukhman, Vladimir Y.: *See—*
Goldin, Rodion G.; Tukhman, Vladimir Y.; and Yakimenko, Valentin G., 4,311,950, Cl. 318-718.000.
Tung, Lu H.; Kirkby, Larry L.; and Lyons, Charles E., to Dow Chemical Company, The. Preparation of alkenyl aromatic monomer butadiene rubber. 4,311,819, Cl. 526-173.000.
Tunze, Norbert. Filter for use with an aquarium. 4,311,588, Cl. 210-169.000.
Tyrone Hydraulics, Inc.: *See—*
Eley, James M.; and Joyce, Arthur B., 4,311,445, Cl. 418-132.000.
Ueda, Makoto; Torisawa, Akira; Otawa, Shuji; Mandai, Masaaki; Shida, Masaharu; and Sato, Katsuhiko, to Kabushiki Kaisha Daini Seikosha. Detection device of electronic timepiece. 4,311,947, Cl. 318-696.000.
Ueda, Makoto: *See—*
Mandai, Masaaki; Torisawa, Akira; Ueda, Makoto; Asano, Kazuhiro; Shida, Masaharu; and Satoh, Katsuhiko, 4,312,059, Cl. 368-157.000.
Shida, Masaharu; Torisawa, Akira; and Ueda, Makoto, 4,312,058, Cl. 368-66.000.
Uedaira, Satoru; Ito, Shigeyasu; Aso, Koichi; and Hayakawa, Masatoshi, to Sony Corporation. Method of manufacturing a high permeability amorphous magnetic alloy. 4,311,539, Cl. 148-121.000.
Uede, Hisashi; Inami, Yasuhiko; Hamada, Hiroshi; Hishida, Tadanori; and Nakauchi, Hiroshi, to Sharp Kabushiki Kaisha. Driving technique for electrochromic displays of the segmented type including means for detecting a change in the display state of the segments thereof. 4,312,000, Cl. 340-785.000.
Ueno, Katsuji: *See—*
Imai, Shozaburo; Suzuki, Haruo; Asai, Kuniaki; and Ueno, Katsuji, 4,311,823, Cl. 528-181.000.
Ueno, Susumu: *See—*
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, 4,311,828, Cl. 528-483.000.
Ueno, Takashi: *See—*
Saito, Takeshi; Ueno, Takashi; and Kashiwagi, Hideo, 4,311,368, Cl. 351-165.000.
Ueno, Tamotsu; Takahashi, Takehiko; Takada, Kazuo; Hidaka, Toshio; and Takagawa, Makoto, to Mitsubishi Gas Chemical Company, Inc. Process for converting hydrocarbon. 4,311,868, Cl. 585-747.000.
Ueno, Tamotsu: *See—*
Takagawa, Makoto; Ueno, Tamotsu; and Takahashi, Takehiko, 4,311,867, Cl. 585-736.000.
Ulmer, Richard W.: *See—*
Kelley, Stephen H.; and Ulmer, Richard W., 4,311,988, Cl. 340-347.0DA.
Ultraseal International Limited: *See—*
Young, Peter D., 4,311,735, Cl. 427-295.000.
Ulug, Mehmet E., to Texas Instruments Incorporated. Transparent intelligent network for data and voice. 4,312,065, Cl. 370-94.000.
Umeki, Shinji, to TDK Electronics Co., Ltd. Process for producing iron oxide containing magnetite. 4,311,684, Cl. 423-632.000.
Unagami, Shigeyuki: *See—*
Murano, Kazuo; Unagami, Shigeyuki; Itoh, Yoshikazu; Amano, Fumio; and Hayashi, Tatsuki, 4,312,075, Cl. 375-106.000.
Unger, Artur: *See—*
Hoffmann, Ernst; Schatz, Friedrich; and Unger, Artur, 4,311,002, Cl. 57-293.000.
Unger, Hans W.: *See—*
Backstein, Guenter; and Unger, Hans W., 4,311,097, Cl. 102-229.000.
Uni-Cardan Aktiengesellschaft: *See—*
Krude, Werner, 4,311,027, Cl. 64-23.700.
Union Camp Corporation: *See—*
Firth, William C., Jr., 4,311,600, Cl. 252-8.50C.
Union Carbide Canada Limited: *See—*
Su, Chung-Sin, 4,311,808, Cl. 525-222.000.
Union Carbide Corporation: *See—*
Yerushalmy, Yosef, 4,311,897, Cl. 219-121.0PP.
Union Oil Company of California: *See—*
Baron, Kenneth; and McArthur, Dennis P., 4,311,581, Cl. 208-115.000.
Hass, Robert H.; and Hansford, Rowland C., 4,311,683, Cl. 423-573.00G.
United Kingdom Atomic Energy Authority: *See—*
Knowles, Alan N., 4,311,559, Cl. 376-432.000.
United States of America
America: *See—*
Bloom, Jeffrey A., 4,310,979, Cl. 40-607.000.
Army: *See—*
Ballato, Arthur; and Vig, John R., 4,311,938, Cl. 310-311.000.
Johnson, Curtis D.; and Baker, Philip L., 4,311,082, Cl. 89-191.00R.
Commerce: *See—*
McBee, William C.; and Sullivan, Thomas A., 4,311,826, Cl. 528-389.000.
Energy: *See—*
Stang, Louis G., 4,311,409, Cl. 405-52.000.
Interior: *See—*
Smith, Gregory E.; Huiatt, Jerry L.; and Shirts, Monte B., 4,311,584, Cl. 209-12.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Lombardi, Frank. Hermetic seal for a shaft. 4,311,057, Cl. 74-18.100.
Salama, Amal M. Efficiency of silicon solar cells containing chromium. 4,311,870, Cl. 136-261.000.
Taylor, Larry T.; St. Clair, Anne K.; Carver, Vicki C.; and Furtsch, Thomas A. Electrically conductive palladium containing polyimide films. 4,311,615, Cl. 252-514.000.
National Aeronautics and Space Administration: *See—*
Freeman, E. Thomas; Stump, Charles W.; and Dreisbach, Francis W., 4,311,378, Cl. 354-217.000.
Vykukal, Hubert C.; and Webbon, Bruce W., 4,311,055, Cl. 73-862.080.
Navy: *See—*
Gilligan, William H.; and Sitzmann, Michael E., 4,311,649, Cl. 260-455.00A.
Konrad, William L.; and Clay, William L., 4,311,929, Cl. 307-529.000.
Koper, Kenneth T., 4,311,290, Cl. 244-110.00R.
Supcoe, Robert F., 4,311,623, Cl. 260-18.00S.
U.S. Philips Corporation: *See—*
Buik, Dirk A.; and Tietjens, Eduard W., 4,310,968, Cl. 30-34.200.

de Niet, Edmond; and Rijckaert, Albert M. A., 4,312,073, Cl. 375-19.000.
Doring, Michael, 4,312,010, Cl. 346-140.00R.
Fitzgerald, John; and Van Hoorn, Willem L., 4,311,940, Cl. 313-273.000.
Goldowsky, Michael P., 4,310,930, Cl. 3-1.700.

United Technologies Corporation: *See—*
Kildea, Robert J., 4,311,432, Cl. 415-134.000.

Universal Foam Systems, Inc.: *See—*
Harding, Gary, 4,311,254, Cl. 222-145.000.

Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG: *See—*
Sommer, Werner; Schieber, Hans; Krause, Erich; Radel, Franz; Trumper, Werner; Rieche, Henning; Tollkuhn, Dieter; Retallick, David; Weingartner, Albin; and Doslik, Peter R., 4,311,029, Cl. 66-75.200.

University of Saskatchewan: *See—*
Khachatourians, George G., 4,311,797, Cl. 435-172.000.

University of Southern California, The: *See—*
Vlachakis, Nicholas D., 4,311,790, Cl. 435-15.000.

University Patents Inc.: *See—*
Burchiel, Scott W.; Crockford, David R.; and Rhodes, Buck A., 4,311,688, Cl. 424-1.000.

UOP Inc.: *See—*
Moorhouse, David, 4,311,338, Cl. 297-411.000.

Upjohn Company, The: *See—*
Sih, John C., 4,311,834, Cl. 542-429.000.
Sih, John C., 4,311,835, Cl. 542-429.000.

Upton, Hubert W.; and Goodman, James R., to Textron, Inc. Vibratory scan optical display. 4,311,999, Cl. 340-755.000.

Urabe, Masanobu: *See—*
Kaetsu, Isao; Kumakura, Minoru; Yoshida, Masaru; Shimaoka, Goro; and Urabe, Masanobu, 4,311,732, Cl. 427-164.000.

USM Corporation: *See—*
Hold, Peter; Notte, Angelo J.; and Rizzi, Marc A., 4,311,446, Cl. 425-144.000.

Usui, Katsutoshi: *See—*
Ona, Isao; Ozaki, Masaru; and Usui, Katsutoshi, 4,311,626, Cl. 260-29.20M.

Utsugi, Akira: *See—*
Kakizaki, Tadao; Utsugi, Akira; Hibino, Masahiro; and Otsubo, Kizuku, 4,311,129, Cl. 123-588.000.

Utting, George R.; and Graham, Scott M., to Victoreen Incorporated. Geiger-Mueller tube coincidence loss correction circuit. 4,311,909, Cl. 250-374.000.

Valentine, Gordon: *See—*
Bradley, Philip E.; and Valentine, Gordon, 4,311,309, Cl. 273-85.00B.

Vandergriff, Arvel L. Gin rib. 4,310,949, Cl. 19-62.00R.

van der Lely, Cornelis. Agricultural tractors and other vehicles. 4,311,203, Cl. 180-24.000.

VanderVaart, Gerry, to Kool-Fire Ltd. Heat-augmented heat exchanger. 4,311,191, Cl. 165-29.000.

VanderVaart, Gerry, to Kool-Fire Limited. Heat-augmented heat exchanger. 4,311,192, Cl. 165-29.000.

Vanguard Machinery Corp.: *See—*
Pulda, William F., 4,311,425, Cl. 414-84.000.

Van Hoorn, Willem L.: *See—*
Fitzgerald, John; and Van Hoorn, Willem L., 4,311,940, Cl. 313-273.000.

Van Humbeeck, Luc: *See—*
Birnbaum, Jay E.; Van Humbeeck, Luc; and Dessy, Franz, 4,311,707, Cl. 424-305.000.

van Kuijk, Josephus P. M., to Patlico Rights N.V. Solar heat collector. 4,311,132, Cl. 126-438.000.

Varian Associates, Inc.: *See—*
Coad, George L.; Shaw, R. Howard; and Hutchinson, Martin A., 4,311,427, Cl. 414-217.000.
Welch, Kimo M., 4,311,018, Cl. 62-55.500.

Vaseen, Vesper A. Wind powered generator with gravity assisted mechanical advantage booseter. 4,311,918, Cl. 290-55.000.

Vasquez, Pete C. Smoke removal apparatus with suction or blowing and directional discharge options. 4,311,198, Cl. 169-11.000.

Vassiliou, Eustathios, to Du Pont de Nemours, E. I., and Company. Heat stable polymer coating composition with antioxidant. 4,311,634, Cl. 260-42.270.

VDO Adolf Schinling AG: *See—*
Marzolf, Rene, 4,312,001, Cl. 340-870.160.

VEB Werk fur Fernsehelektronik im VEB Kombinat Mikroelektronik: *See—*
Zaschke, Horst; Demus, Dietrich; Wiegeleben, Adalbert; and Bottger, Uta, 4,311,610, Cl. 252-299.610.

Vedova, Ralph; and Jabs, Alfred, to MTU Motoren-und Turbinen-Union Munchen GmbH. Clearance sealing arrangement for jet thrust deflection equipment. 4,311,313, Cl. 277-27.000.

Veeder, George T.: *See—*
Kang, Kenneth S.; and Veeder, George T., 4,311,795, Cl. 435-101.000.

Velazquez, Juan F.: *See—*
Wegryn, William; and Velazquez, Juan F., 4,311,399, Cl. 400-76.000.

Verachtert, Hubert, to Interox Chemicals Limited. Disinfection of aqueous media. 4,311,598, Cl. 210-757.000.

Vercillo, Alfredo J., to General Binding Corporation. Laminator with heating control system. 4,311,549, Cl. 156-308.200.

Verdone, Gary F., to Combustion Engineering, Inc. Stabilizing device for control rod tip. 4,311,560, Cl. 376-225.000.

Verhaeghe, Robert C.; and Huggins, Homer D., to Modine Manufacturing Company. Serpentine fin heat exchanger. 4,311,193, Cl. 165-149.000.

Verros, James M., to CMI Corporation. Self-locking folding outrigger assembly. 4,311,322, Cl. 280-656.000.

Verschuur, Eke, to Shell Oil Company. Process for the upgrading of coal. 4,311,488, Cl. 44-10.00R.

Victor Company of Japan, Limited: *See—*
Kuribayashi, Yasuji, 4,311,994, Cl. 340-661.000.

Victoreen Incorporated: *See—*
Utting, George R.; and Graham, Scott M., 4,311,909, Cl. 250-374.000.

Vig, John R.: *See—*
Ballato, Arthur; and Vig, John R., 4,311,938, Cl. 310-311.000.

Ville, Frans J.: *See—*
Lemahieu, Raymond G.; Moelants, Felix J.; and Ville, Frans J., 4,311,787, Cl. 430-522.000.

Vinals, Joaquin F.: *See—*
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,311,602, Cl. 252-8.600.
Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,311,754, Cl. 428-284.000.

Vink, Walter; and Deptula, Richard W., to Life Savers, Inc. High fructose hard candy. 4,311,722, Cl. 426-660.000.

Vitale, John: *See—*
Karl, Robert D.; Kentosh, James M.; and Vitale, John, 4,310,937, Cl. 9-8.00P.

Vitez, Lou: *See—*
Modes, Vernon E.; Tam, Hak W.; Quinton, Wayne E.; Bailey, Alan G.; Niskanen, Robert A.; Vitez, Lou; and DeBardi, Gary A., 4,311,152, Cl. 128-641.000.

Vlachakis, Nicholas D., to University of Southern California, The. Radioenzymatic method for assaying 3,4-dihydroxyphenylglycol. 4,311,790, Cl. 435-15.000.

Vock, Manfred H.: *See—*
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,311,602, Cl. 252-8.600.
Trenkle, Robert W.; Mookherjee, Braja D.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,311,754, Cl. 428-284.000.

Vogel, Charles B.; and Herolz, Robert A., to Shell Oil Company. Method for identifying weak sands. 4,312,052, Cl. 367-75.000.

Vogel, Dieter: *See—*
Pelkmann, Bernhard; Vogel, Dieter; and Schenkl, Alfred, 4,311,949, Cl. 318-799.000.

Vogel, Klaus, to Siemens Aktiengesellschaft. Radio frequency transmission system. 4,312,072, Cl. 375-1.000.

Volkl, Franz; Adam, Gunter; and Klose, Volker, to Franz Volkl OHG. Tennis racket. 4,311,308, Cl. 273-73.00G.

Volkswagenwerk Aktiengesellschaft: *See—*
Siebeneichen, Kurt, 4,311,112, Cl. 118-408.000.

von Rutte, Richard: *See—*
Eckhardt, Claude; and von Rutte, Richard, 4,311,605, Cl. 252-102.000.

von Taschitzki, Rainer, to Aratowerk Walter von Taschitzki. Animal drinking fountain. 4,311,117, Cl. 119-75.000.

Vykukal, Hubert C.; and Webbon, Bruce W., to United States of America, National Aeronautics and Space Administration. Pressure suit joint analyzer. 4,311,055, Cl. 73-862.080.

Vyzhimov, Vladimir: *See—*
Andreev, Oleg M.; Zakurdaev, Anatoly V.; and Vyzhimov, Vladimir, 4,311,769, Cl. 428-642.000.

W. R. Grace & Co.: *See—*
Siadat, Bahram, 4,311,655, Cl. 264-22.000.

W. R. Stamler Corporation, The: *See—*
Ratcliff, Edward H., Jr., 4,311,284, Cl. 241-191.000.

Wacker-Chemie GmbH: *See—*
Opavsky, Werner; Reisner, Josef; and Maier, Alois, 4,311,563, Cl. 203-46.000.

Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH: *See—*
Bugl, Erwin; Griesshammer, Rudolf; Lorenz, Helmut; Hamster, Helmut; and Koppl, Franz, 4,311,545, Cl. 156-613.000.

Waddell, Richard G., to Eric A. Stern. Selective trigger unit for multiple barrel firearms. 4,310,981, Cl. 42-42.00R.

Wagle, William E., to Emhart Industries, Inc. Means providing intermittent motion to a cam means of a timing mechanism. 4,311,059, Cl. 74-116.000.

Wagner, Horst R.: *See—*
Ansari, Hifzur R.; Isaac, Benjamin O.; and Wagner, Horst R., 4,311,617, Cl. 252-522.00R.

Wagner, John W.: *See—*
Crescentini, Lamberto; Blackman, Webb B., Jr.; DeCaprio, Joseph D.; Fisher, William B.; Lilley, Roy J., Jr.; and Wagner, John W., 4,311,642, Cl. 260-239.30A.

Wagner, Joseph E., III; and Williams, Lloyd E., to J. M. Huber Corporation. Method of producing inorganic water-softening beads. 4,311,609, Cl. 252-179.000.

Wagner, Wolfgang: *See—*
Riessland, Eberhard; Wagner, Wolfgang; and Opitz, Gunter, 4,311,959, Cl. 324-61.00P.

Wahbeh, Valery N.: *See*—
Benjes, Henry H.; Wahbeh, Valery N.; and Stukenberg, John R., 4,311,593, Cl. 210-603.000.
Wain-Roy, Inc.: *See*—
Arnold, Carroll H., 4,311,428, Cl. 414-723.000.
Walker, Loren H.; and Cutler, John H., to General Electric Company. Apparatus and method for high slip operation of an AC electric motor at substantially zero rotation and substantially zero torque. 4,311,951, Cl. 318-778.000.
Walker, Norman A. Shellfish rake construction. 4,311,332, Cl. 294-50.900.
Walker, Richard P., to GTE Products Corporation. Wire pulling hand tool. 4,311,069, Cl. 81-3.00J.
Wall Industries, Inc.: *See*—
Hood, Henry A., 4,311,079, Cl. 87-6.000.
Wallace Business Forms, Inc.: *See*—
Steidinger, Donald J., 4,311,325, Cl. 282-11.50A.
Wallace, Robert L., Jr., to Bell Telephone Laboratories, Incorporated. Teleconference microphone arrays. 4,311,874, Cl. 179-1.0CN.
Walley, Don C., to Ranco Incorporated. Self contained heating and cooling system with emergency heating. 4,311,190, Cl. 165-25.000.
Wallis, Bernard J. Workpiece transfer mechanism. 4,311,429, Cl. 414-750.000.
Wallis, Craig: *See*—
Melnick, Joseph L.; and Wallis, Craig, 4,311,794, Cl. 435-32.000.
Walsh, John M., III, to Bull & Roberts, Inc. Safety dispenser attachment for dangerous liquid additives. 4,311,174, Cl. 141-383.000.
Walter, Lothar: *See*—
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; Ernst, Horst M.; and Schido, Friedrich, 4,311,348, Cl. 308-6.00C.
Walther, James F., to Allied Chemical Corporation. Process for production of electrical energy from the neutralization of acid and base in a bipolar membrane cell. 4,311,771, Cl. 429-51.000.
Wandeloski, James C. Method of upholstering a couch and edge wire spring stabilizing clamp. 4,310,959, Cl. 29-91.100.
Wang, Clark S.: *See*—
Frank, Howard; Swafford, John W., Jr.; Farazi, Perry; Patel, Arvind M.; Chan, Cheuk-Wah; Dohnal, Edward J.; Wang, Clark S.; and Mehta, Ashokkumar D., 4,312,043, Cl. 364-551.000.
Wang, Ricky K., to Yarway Corporation. Inverted bucket steam trap. 4,311,162, Cl. 137-185.000.
Wang, Tse L.: *See*—
Berkowitz, Paul R.; Quinn, Thomas M.; Trimble, David C.; and Wang, Tse L., 4,311,878, Cl. 179-16.0EC.
Warner, Brady, to Communications Satellite Corporation. TDM Data reorganization apparatus. 4,312,063, Cl. 370-68.000.
Waschulewski, Hans-Georg. Position sensor. 4,311,888, Cl. 200-52.00R.
Watanabe, Kinji, to Toyo Kogyo Co., Ltd. Panel reinforcement structures for automobile bodies. 4,311,744, Cl. 428-83.000.
Watanabe, Masahiro; and Horikawa, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Noise pulse suppressing system. 4,311,963, Cl. 328-163.000.
Watanabe, Minoru: *See*—
Hotta, Mitsuhiko; and Watanabe, Minoru, 4,311,461, Cl. 433-33.000.
Watanabe, Yushiyo; Kimura, Toshihiko; and Kurata, Masayuki, to Akebono Brake Industry Co., Ltd. Caliper guiding mechanism for disc brake. 4,311,219, Cl. 188-71.800.
Waters, John E., Jr. Running board assembly having a universal mounting bracket. 4,311,320, Cl. 280-163.000.
Watkins, Kenneth M. Vending system for floral type products. 4,311,227, Cl. 194-4.00C.
Watral, James P. Air conditioning servicing apparatus. 4,311,023, Cl. 62-468.000.
Way, Joe W., Jr.: *See*—
Thompson, Glen L.; and Way, Joe W., Jr., 4,311,226, Cl. 193-35.00R.
Weaver, Shirley S.: *See*—
Snyder, Charles W.; and Weaver, Shirley S., 4,311,319, Cl. 280-11.280.
Webb, Michael G., to British Petroleum Company Limited, The. Fairlead. 4,311,109, Cl. 114-220.000.
Webber, J. Allan, to Eli Lilly and Company. Certain heterocyclic thiomethyl derivatives of 7-(dihalogenated phenylthioacetamido)-cephalosporanic acids useful in the treatment of infections caused by *Streptococcus faecalis*. 4,311,837, Cl. 544-26.000.
Webbon, Bruce W.: *See*—
Vykukal, Hubert C.; and Webbon, Bruce W., 4,311,055, Cl. 73-862.080.
Weber, Jurgen; Falk, Volker; and Kniep, Claus, to Ruhrchemie Aktiengesellschaft. Process for the production of di-n-propyl-acetic acid. 4,311,854, Cl. 562-531.000.
Weber, Suso: *See*—
Kasper, Erich; and Weber, Suso, 4,311,743, Cl. 428-64.000.
Webster, Jerry H.: *See*—
Galland, Gerald D., 4,311,288, Cl. 242-86.50R.
Wecker, Wilhelm: *See*—
Heyer, Gunther; Kany, Karl; Spichala, Paul; Wossner, Felix; and Wecker, Wilhelm, 4,311,302, Cl. 267-64.230.
Wegryn, William; and Velazquez, Juan F., to Sycor, Inc. Method and apparatus for setting and varying margins and line spacing on data printers. 4,311,399, Cl. 400-76.000.
Weikl, Andreas; and Hubmann, Max, to Intermedicat GmbH. Catheter connecting head with at least one duct in a base member. 4,311,136, Cl. 128-214.400.
Weil, Edward D.: *See*—
Abramson, Alan; and Weil, Edward D., 4,311,652, Cl. 260-969.000.
Weingartner, Albin: *See*—
Sommer, Werner; Schieber, Hans; Krause, Erich; Radel, Franz; Trumper, Werner; Rieche, Henning; Tollkuhn, Dieter; Retallick, David; Weingartner, Albin; and Doslik, Peter R., 4,311,029, Cl. 66-75.200.
Weinschenk, Kurt: *See*—
Ries, Karl; Hannoschock, Kurt; Rozic, Krsto-Marijan; Basler, Gunter; Sperl, Harald; and Weinschenk, Kurt, 4,311,905, Cl. 250-321.000.
Weis, Christopher H.: *See*—
Lacy, F. Hilton, Jr.; and Weis, Christopher H., 4,311,241, Cl. 209-570.000.
Weis, Frank G., to Ecodyne Corporation. Comminutor installation. 4,311,281, Cl. 241-46.00R.
Weisrock, William P., to Standard Oil Company (Indiana). Method for improving specific xanthan productivity during continuous fermentation. 4,311,796, Cl. 435-104.000.
Weitemeyer, Christian; and Koerner, Gotz, to Th. Goldschmidt AG. Process for the preparation of crosslinked organopoly-siloxanes and their use as active ingredient of abhesive coating materials for two-dimensional carriers. 4,311,821, Cl. 528-15.000.
Welch, Elmer S., to Superior Stainless, Inc. Valve handle retention system. 4,311,164, Cl. 137-315.000.
Welch, Kimo M., to Varian Associates, Inc. Cryogenic pump. 4,311,018, Cl. 62-55.500.
Wells Manufacturing Corporation: *See*—
Titus, Timothy C., 4,311,074, Cl. 83-816.000.
Wenzel, Reinhard: *See*—
Pav, Joseph; and Wenzel, Reinhard, 4,311,091, Cl. 100-161.000.
Wenzl, Helmut: *See*—
Klatt, Karl-Heinz; and Wenzl, Helmut, 4,311,232, Cl. 206-0.700.
Wernick, Jack H.: *See*—
Chin, Gilbert Y.; Green, Martin L.; Sherwood, Richard C.; and Wernick, Jack H., 4,311,537, Cl. 148-108.000.
West, Wilbur W.: *See*—
Raghava, Ram S.; and West, Wilbur W., 4,311,757, Cl. 428-323.000.
Westerlund, Herbert A.; and Westerlund, Robert E., to Construction Forms, Inc. High pressure coupling apparatus. 4,311,248, Cl. 277-206.00R.
Westerlund, Robert E.: *See*—
Westerlund, Herbert A.; and Westerlund, Robert E., 4,311,248, Cl. 277-206.00R.
Western Stamping Corporation: *See*—
Ogawa, Mikio, 4,311,901, Cl. 235-12.000.
Westinghouse Electric Corp.: *See*—
Bartko, John; Tarneja, Krishan S.; Chu, Chang K.; and Schlegel, Earl S., 4,311,534, Cl. 148-1.500.
Boykin, John R., 4,311,964, Cl. 329-104.000.
Bratton, Raymond J.; and Andersson, Clarence A., 4,311,433, Cl. 416-97.00A.
Gilmour, George A., 4,311,391, Cl. 356-361.000.
Kowalski, Edward F.; Swidwa, Kenneth J.; and Hornak, Leonard P., 4,311,557, Cl. 376-271.000.
Putman, Thomas H.; and Ramey, Donald G., 4,311,253, Cl. 322-25.000.
Stana, Regis R.; Mitchell, Edward; Rudolph, Joseph S.; and Lopez, Jose G., 4,311,675, Cl. 423-8.000.
Whirlpool Corporation: *See*—
Rucktenwald, Thomas E.; Braun, William E., Jr.; Lazare, Louis S.; Lin, Sharming; and Melcher, Byron, 4,311,076, Cl. 84-1.030.
White, Pat M., to Otis Engineering Corporation. Liner hanger and running and setting tool. 4,311,194, Cl. 166-120.000.
White, Preston S., to PPG Industries, Inc. Treatment of permionic membrane. 4,311,567, Cl. 204-98.000.
White, Sebastian N.: *See*—
Goulianos, Konstantin; Smith, Karen K.; and White, Sebastian N., 4,311,908, Cl. 250-374.000.
White, Thomas B., to Louvers & Dampers, Inc. Louver assembly. 4,310,993, Cl. 52-473.000.
Whiteford, Carl. Double ended adjustable wrench. 4,311,070, Cl. 81-77.000.
Whitehead, Kenneth E.: *See*—
Biggs, Ian; Goy, Ronald S.; and Whitehead, Kenneth E., 4,311,547, Cl. 156-244.130.
Whittley, Donald C.: *See*—
Gilbertson, Frederick L.; Garland, Douglas B.; and Whittley, Donald C., 4,311,291, Cl. 244-211.000.
Wickman, Klaus: *See*—
Isberg, Gary J.; Wickman, Klaus; and Reid, David, 4,310,972, Cl. 30-382.000.
Wiegeleben, Adalbert: *See*—
Zaschke, Horst; Demus, Dietrich; Wiegeleben, Adalbert; and Bottger, Uta, 4,311,610, Cl. 252-299.610.
Wildgoose, Charles R., to Gillette Company, The. Display and dispensing containers. 4,311,234, Cl. 206-354.000.
Wildonger, Kenneth J.: *See*—
Christensen, Burton G.; Leanza, William J.; Shih, David H.; and Wildonger, Kenneth J., 4,311,704, Cl. 424-274.000.
Wiley, Richard H. Di-n-alkyl dicarboxypyrazinedicarboxylates and ferrous complexes. 4,311,843, Cl. 544-225.000.
Williams, Danny L.: *See*—
Betz, Norman L.; Lanter, Kent J.; and Williams, Danny L., 4,311,713, Cl. 426-2.000.

Williams, Eric A. Method and apparatus for forming a container for liquids. 4,311,476, Cl. 493-176.000.

Williams, James W.: *See—*
Saltzman, Robert S.; and Williams, James W., 4,311,485, Cl. 23-230.00R.

Williams, Lloyd E.: *See—*
Wagner, Joseph E., III; and Williams, Lloyd E., 4,311,609, Cl. 252-179.000.

Willmouth, Frank M.: *See—*
Barham, Peter J.; Odell, Jeffrey A.; and Willmouth, Frank M., 4,311,660, Cl. 264-342.0RE.

Wilson Foods Corporation: *See—*
Hendricks, Thomas E.; and Groenert, George J., 4,311,420, Cl. 410-121.000.

Wilson, Thomas A.: *See—*
Neary, Michael P.; and Wilson, Thomas A., 4,311,603, Cl. 252-70.000.

Wilt, Paxton M.: *See—*
Ravve, Abraham; and Wilt, Paxton M., 4,311,250, Cl. 220-458.000.

Wilten, Stanley M. Picture display device. 4,310,976, Cl. 40-152.100.

Winfield, Augustus W., to Hewlett-Packard Company. Synchronized graphics ink jet printer. 4,312,007, Cl. 346-140.00R.

Winiecki, Henry F.: *See—*
Winiecki, Tadeus, 4,311,335, Cl. 296-78.100.

Winiecki, Martha M.: *See—*
Winiecki, Tadeus, 4,311,335, Cl. 296-78.100.

Winiecki, Tadeus, to Winiecki, Henry F.; and Winiecki, Martha M., part interest to each. Crash resistant motorcycle. 4,311,335, Cl. 296-78.100.

Winston, Laura: *See—*
Cannizzaro, Joseph; and Winston, Laura, 4,310,969, Cl. 30-113.100.

Wisconsin Oven Corp.: *See—*
Lauersdorf, Duane H.; and Camp, Larry A., 4,311,460, Cl. 432-247.000.

Wittig, Karl R.: *See—*
Balzer, Gerry C.; Gordon, Alan M.; Leibowitz, Michael W.; and Wittig, Karl R., 4,311,880, Cl. 179-99.00H.

Witzel, Bruce E.: *See—*
Dybas, Richard A.; Grier, Nathaniel; and Witzel, Bruce E., 4,311,709, Cl. 424-330.000.

Woisetschlager, Helmut: *See—*
Golser, Leopold; and Woisetschlager, Helmut, 4,311,802, Cl. 521-133.000.

Wojskowy Instytut Chemii I Radiometrii: *See—*
Zaremba, Marek; Rozycki, Czeslaw; and Staszewski, Rafal, 4,311,664, Cl. 422-54.000.

Wolf, Peter H.: *See—*
Taub, Howard H.; and Wolf, Peter H., 4,312,008, Cl. 346-140.00R.

Wolfe, Terry L.: *See—*
Reader, William D.; and Wolfe, Terry L., 4,311,509, Cl. 65-351.000.

Wolfinger, Mark D., to Monsanto Company. N-(α-Alkylbenzylthio)-succinimide. 4,311,813, Cl. 525-348.000.

Wolski, Karlheinz: *See—*
Becker, Klaus; and Wolski, Karlheinz, 4,311,215, Cl. 188-8.000.

Wonder, Terry M., to Sorenson Research Co., Inc. Detachable balloon catheter apparatus and method. 4,311,146, Cl. 128-325.000.

Wong, Andrew H., to Minnesota Mining and Manufacturing Company. Polyester films with improved processability and tear resistance. 4,311,741, Cl. 428-35.000.

Wong, Yun P.: *See—*
Gilligan, Thomas J.; Smith, James E.; and Wong, Yun P., 4,312,048, Cl. 365-195.000.

Wood, Kenneth H., to Moxham Industrial Pty., Ltd. Descent control unit. 4,311,217, Cl. 188-65.200.

Woodle, Robert A., to Texaco, Inc. Solvent extraction process. 4,311,583, Cl. 208-312.000.

Workman, Erwin F., Jr.; and Clark, Deborah M., to Abbott Laboratories. Method and apparatus for collecting blood samples. 4,311,482, Cl. 23-230.00B.

Wossner, Felix: *See—*
Heyer, Gunther; Kany, Karl; Spichala, Paul; Wossner, Felix; and Wecker, Wilhelm, 4,311,302, Cl. 267-64.230.

Wren, Lawrence D. Side delivery attachment for spreader truck. 4,311,408, Cl. 404-104.000.

Wright, Edward J., to Baker Perkins Holdings Limited. Processor for dough working. 4,311,397, Cl. 366-98.000.

Wu, Tai-Wing, to Eastman Kodak Company. Separation and isolation of conjugated and unconjugated bilirubin. 4,311,665, Cl. 422-56.000.

Wunderlich, Frederick J. Portable tent shelter. 4,311,159, Cl. 135-1.00R.

Wurmfeld, Charles J. Gas-powered engine adapted to utilize stored solar heat energy and compressed gas power system. 4,311,010, Cl. 60-641.800.

Wurst, Bert: *See—*
Breckel, Werner; and Wurst, Bert, 4,311,924, Cl. 307-354.000.

Yagi, Hideyuki: *See—*
Horiuchi, Junichiro; and Yagi, Hideyuki, 4,310,965, Cl. 29-580.000.

Yakimenko, Valentin G.: *See—*
Goldin, Rodion G.; Tukhman, Vladimir Y.; and Yakimenko, Valentin G., 4,311,950, Cl. 318-718.000.

Yallup, Albert E.: *See—*
Hewitt, Sidney J.; Ozamiz, Juan M.; and Yallup, Albert E., 4,311,957, Cl. 324-58.50R.

Yamada, Koichi; Harato, Takuo; Kato, Hisakatsu; and Shiozaki, Yasumi, to Sumitomo Aluminium Smelting Company, Limited. Process for producing coarse grains of aluminum hydroxide. 4,311,486, Cl. 23-301.000.

Yamada, Koichiro, to Hitachi, Ltd. Exhaust bypass type turbo-charger. 4,311,008, Cl. 60-602.000.

Yamakita, Tooru, to Casio Computer Co., Ltd. Electronic cash register with single printer for printing receipts and a journal. 4,312,037, Cl. 364-405.000.

Yamanouchi Pharmaceutical Co., Ltd.: *See—*
Koda, Akio; Isaka, Ichiro; and Murakami, Yukiyasu, 4,311,842, Cl. 544-27.000.

Yamashita, Hiroshi: *See—*
Akino, Morio; Yanagida, Seiichi; and Yamashita, Hiroshi, 4,311,286, Cl. 242-55.19A.

Yamauchi, Junnosuke: *See—*
Moritani, Tohei; Yamauchi, Junnosuke; and Shiraishi, Makoto, 4,311,805, Cl. 525-60.000.

Yamauchi, Kozi: *See—*
Tsubaki, Toshio; Tokunaga, Takeshi; Yonekura, Seiji; Matsuoka, Shigeru; Miura, Makoto; and Yamauchi, Kozi, 4,311,225, Cl. 192-142.00R.

Yanagida, Seiichi: *See—*
Akino, Morio; Yanagida, Seiichi; and Yamashita, Hiroshi, 4,311,286, Cl. 242-55.19A.

Yanmar Diesel Engine Co., Ltd.: *See—*
Banba, Tosio; Morichika, Katsuyuki; and Nakanishi, Tetsuya, 4,311,122, Cl. 123-279.000.

Yarway Corporation: *See—*
Wang, Ricky K., 4,311,162, Cl. 137-185.000.

Yasuhara, Kiyotada; Takahashi, Masashi; Murakami, Ryoichi; and Senzaki, Takashi. Composition for forming zinc phosphate coating over metal surface. 4,311,535, Cl. 148-6.15Z.

Yasui, Tadashi; Nakamura, Isamu; and Goto, Shigeo, to Sybron Corporation. Method of manufacturing glass-lined metal tubes. 4,311,505, Cl. 65-43.000.

Yazaki, Susumu; and Matsumura, Takeshi, to Bridgestone Tire Company Limited. Thickness measuring apparatus for non-metallic sheet-shaped bodies. 4,311,392, Cl. 356-375.000.

Yee, Henry C., to Bendix Corporation, The. Single line multiplexing system for sensors and actuators. 4,311,986, Cl. 340-825.630.

Yellow Springs Instrument Company, Inc., The: *See—*
Trietley, Harry L., Jr., 4,311,982, Cl. 338-195.000.

Yerushalmy, Yosef, to Union Carbide Corporation. Plasma arc torch and nozzle assembly. 4,311,897, Cl. 219-121.0PP.

Yonekura, Seiji: *See—*
Tsubaki, Toshio; Tokunaga, Takeshi; Yonekura, Seiji; Matsuoka, Shigeru; Miura, Makoto; and Yamauchi, Kozi, 4,311,225, Cl. 192-142.00R.

York, Alen S.; and York, Judd M., to Countess York, Ltd. Garment. 4,310,925, Cl. 2-69.500.

York, Judd M.: *See—*
York, Alen S.; and York, Judd M., 4,310,925, Cl. 2-69.500.

Yoshida, Kazuhiro: *See—*
Iwamoto, Taro; Ando, Shimon; Kusumoto, Sho; Omae, Tsutomu; Suzuki, Toshitaka; Takidera, Masatake; Koyama, Takaichi; Hamada, Kunio; and Yoshida, Kazuhiro, 4,311,556, Cl. 376-249.000.

Yoshida, Kogyo K. K.: *See—*
Inaba, Toshimitsu, 4,311,111, Cl. 118-56.000.

Yoshida, Masaru: *See—*
Kaetsu, Isao; Kumakura, Minoru; Yoshida, Masaru; Shimaoka, Goro; and Urabe, Masanobu, 4,311,732, Cl. 427-164.000.

Yoshida, Shoji: *See—*
Hayakawa, Toshio; and Yoshida, Shoji, 4,311,179, Cl. 152-209.00R.

Yoshino Kogyosho Co., Ltd.: *See—*
Saito, Tadao; Akutsu, Masao; Sugiura, Hiroaki; and Endo, Shuzo, 4,311,246, Cl. 215-100.00A.

Yoshizawa, Kiyoshi; Nojiro, Kikuo; Itoh, Masamitsu; Kiuchi, Hiroshi; and Horii, Kazuo, to National Tax Administration Agency; and Kibun Company Limited. Method of purifying distillers solubles and use of the purified matter. 4,311,721, Cl. 426-623.000.

Young, Edgar J.: *See—*
Kast, Jack L.; and Young, Edgar J., 4,310,982, Cl. 42-75.00B.

Young, Eugene F.: *See—*
deMey, Charles F.; and Young, Eugene F., 4,311,387, Cl. 356-318.000.

Young, Peter D., to Ultraseal International Limited. Impregnation of porous articles. 4,311,735, Cl. 427-295.000.

Young, Walter H., to Pendell Boiler Limited. Forced draught fuel burner. 4,311,449, Cl. 431-284.000.

Youngman, Edward A.; and Schnell, Russell C., to Shell Oil Company. Reducing the effect, in plants, of ice-promoting nuclei originating from certain bacteria. 4,311,517, Cl. 71-121.000.

Youngren, Fred R.: *See—*
Hurd, Wallace A., Jr.; and Youngren, Fred R., 4,311,005, Cl. 60-253.000.

Yugen Kaisha Parusu Giken: *See—*
Junya, Seta, 4,311,896, Cl. 219-10.570.

Yurtin, John A.: *See—*
Plyler, Robert G.; and Yurtin, John A., 4,311,355, Cl. 339-94.00R.

Zabel, Jack H.: *See—*
Stevens, Edward P.; and Zabel, Jack H., 4,310,935, Cl. 5-80.000.

Zahnradfabrik Friedrichshafen, AG: *See—*
Liska, Georg, 4,311,437, Cl. 417-273.000.

Zakurdaev, Anatoly V.: *See—*
Andreev, Oleg M.; Zakurdaev, Anatoly V.; and Vyzhimov, Vladimir, 4,311,769, Cl. 428-642.000.

Zander, Richard A.: *See*—
Koehler, Mark E.; Provder, Theodore; and Zander, Richard A., 4,311,039, Cl. 73-61.400.
Zaremba, Marek; Rozycki, Czeslaw; and Staszewski, Rafal, to Wojskowy Instytut Chemii I Radiometrii. Flame-photometric detector burner of gas chromatograph. 4,311,664, Cl. 422-54.000.
Zaschke, Horst; Demus, Dietrich; Wiegeleben, Adalbert; and Bottger, Uta, to VEB Werk fur Fernsehelektronik im VEB Kombinat Mikroelektronik. Liquid crystalline 5-alkyl-2 (4-acyloxy-phenyl)-pyrimidine. 4,311,610, Cl. 252-299.610.
Zavisza, Daniel M.: *See*—
Casey, Donald J.; and Zavisza, Daniel M., 4,311,748, Cl. 428-204.000.
Zbikowski, Ted: *See*—
Garrett, Wayne H.; and Zbikowski, Ted, 4,311,216, Cl. 188-18.00A.
Zboril, Vaclay G.: *See*—
Mollison, Alistair N.; and Zboril, Vaclay G., 4,311,816, Cl. 526-116.000.
Zellmer, Neale A., to GTE Automatic Electric Laboratories, Inc. DC-to-DC Converter with reduced power loss during turn off. 4,312,029, Cl. 363-21.000.
Zellweger, Ltd.: *See*—
Aeppli, Kurt, 4,311,958, Cl. 324-61.00R.
Ziman, Stephen D., to Chevron Research. Process for making 3-(N-arylamino)-gamma-butyrothiolactones. 4,311,849, Cl. 549-63.000.
Zimmerman, Rene, to Gebrueder Buehler AG. Injection piston for die casting. 4,311,185, Cl. 164-315.000.
Zimmerman, Sheldon B.: *See*—
Hernandez, Sebastian; Zimmerman, Sheldon B.; Gullo, Vincent P.; and Dewey, Ray S., 4,311,693, Cl. 424-122.000.
Zimmermann, Pierre: *See*—
Fort, Francois; and Zimmermann, Pierre, 4,311,501, Cl. 65-3.110.
Zinaida, Zosim: *See*—
Gutnick, David L.; Rosenberg, Eugene; Belsky, Igal; and Zinaida, Zosim, 4,311,829, Cl. 536-18.000.
Gutnick, David L.; Rosenberg, Eugene; Belsky, Igal; and Zinaida, Zosim, 4,311,831, Cl. 536-53.000.
Gutnick, David L.; Rosenberg, Eugene; Belsky, Igal; and Zinaida, Zosim, 4,311,832, Cl. 536-53.000.
Zoomar Corp.: *See*—
Kolb, William P., 4,311,969, Cl. 331-94.50D.
Zosim, Zinaida: *See*—
Gutnick, David L.; Rosenberg, Eugene; Belsky, Igal; and Zosim, Zinaida, 4,311,830, Cl. 536-53.000.
Zublin, Edward A.: *See*—
Lyons, William C.; Rofer-DePoorter, Cheryl K.; Buddecke, Donald B.; and Zublin, Edward A., 4,311,340, Cl. 299-4.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF JANUARY, 1982

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abe, Mitsunobu: *See—*
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,851, Cl. 148-12.00C.

Bauerkemper, Michael, to Thomas & Betts Corporation. Hand tool for joining objects. Re. 30,848, Cl. 29-749.000.

Citizen Watch Co., Inc.: *See—*
Tamaru, Munetaka, Re. 30,852, Cl. 368-80.000.

Crist, Buckley, to Jaclo, Inc. Anti-siphon and backflow prevention valve. Re. 30,849, Cl. 137-218.000.

Gondo, Hisashi: *See—*
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,851, Cl. 148-12.00C.

Gordy, Donald G.; and Klosterman, David P., to Orscheln Co. Self-retaining conduit anchoring device. Re. 30,850, Cl. 403-197.000.

Jaclo, Inc.: *See—*
Crist, Buckley, Re. 30,849, Cl. 137-218.000.

Katsutani, Ryoseki: *See—*
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,851, Cl. 148-12.00C.

Kawano, Tsuyoshi: *See—*
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,851, Cl. 148-12.00C.

Kawasaki, Bunichiro: *See—*
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,851, Cl. 148-12.00C.

Klosterman, David P.: *See—*
Gordy, Donald G.; and Klosterman, David P., Re. 30,850, Cl. 403-197.000.

Morimoto, Masao: *See—*
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,851, Cl. 148-12.00C.

Nippon Steel Corporation: *See—*
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,851, Cl. 148-12.00C.

Nishimura, Teruhiko: *See—*
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,851, Cl. 148-12.00C.

Orscheln Co.: *See—*
Gordy, Donald G.; and Klosterman, David P., Re. 30,850, Cl. 403-197.000.

Saito, Yoshio: *See—*
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,851, Cl. 148-12.00C.

Shiraishi, Masahiko: *See—*
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,851, Cl. 148-12.00C.

Suemune, Kenichiro: *See—*
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,851, Cl. 148-12.00C.

Tadashige, Yoshifumi: *See—*
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,851, Cl. 148-12.00C.

Tamaru, Munetaka, to Citizen Watch Co., Inc. Electronic timepiece. Re. 30,852, Cl. 368-80.000.

Thomas & Betts Corporation: *See—*
Bauerkemper, Michael, Re. 30,848, Cl. 29-749.000.

Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, to Nippon Steel Corporation. Method for producing low-carbon cold rolled steel sheet having excellent cold working properties and an apparatus for continuous treatment thereof. Re. 30,851, Cl. 148-12.00C.

Tsukamura, Takao: *See—*
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,851, Cl. 148-12.00C.

Uehara, Norimasa: *See—*
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,851, Cl. 148-12.00C.

Watanabe, Kurayoshi: *See—*
Toda, Kenzo; Gondo, Hisashi; Kawasaki, Bunichiro; Abe, Mitsunobu; Katsutani, Ryoseki; Kawano, Tsuyoshi; Uehara, Norimasa; Saito, Yoshio; Suemune, Kenichiro; Shiraishi, Masahiko; Tadashige, Yoshifumi; Morimoto, Masao; Tsukamura, Takao; Watanabe, Kurayoshi; and Nishimura, Teruhiko, Re. 30,851, Cl. 148-12.00C.

LIST OF DESIGN PATENTEES

Adimec, Advanced Mechanical Ltd.: *See—*
Meller, Moshe, 262,737, Cl. D24-12.000.

Agfa-Gevaert AG: *See—*
Schlagheck, Norbert; Schultes, Herbert; and Segers, Hermann R., 262,715, Cl. D16-42.000.
Schlagheck, Norbert; Schultes, Herbert; and Segers, Hermann R., 262,716, Cl. D16-42.000.

Airway Industries, Inc.: *See—*
Davis, Michael, 262,669, Cl. D3-71.000.

American Safety Razor Company: *See—*
Chase, David O.; and Iten, Clemens A., 262,672, Cl. D4-19.000.

Anderson, Lloyd T. Shovel. 262,686, 1-19-82, Cl. D7-210.000.

Assmann, Jurgen, to Grossag GmbH. Hot air grill. 262,683, 1-19-82, Cl. D7-85.000.

Atari, Inc.: *See—*
Nelson, Jeffery O.; and Hardy, Douglas A., 262,702, Cl. D14-100.000.
Atwater Bag Corporation: *See—*
Robitaille, Jacques, 262,668, Cl. D3-54.000.
Austin, Marvin L. Hunter's knife. 262,731, 1-19-82, Cl. D22-1.000.
Barrett, Bernard R. Toy airplane. 262,729, 1-19-82, Cl. D21-89.000.
Beck, Donald R. Hose retaining device. 262,689, 1-19-82, Cl. D8-396.000.
Berry, Elmer H., Jr.: *See—*
Berry, Garrett R.; Berry, Patricia A.; Berry, Elmer H., Jr.; and Berry, Katherine S., 262,690, Cl. D8-499.000.
Berry, Garrett R.; Berry, Patricia A.; Berry, Elmer H., Jr.; and Berry, Katherine S. Theatrical sand bag. 262,690, 1-19-82, Cl. D8-499.000.
Berry, Katherine S.: *See—*
Berry, Garrett R.; Berry, Patricia A.; Berry, Elmer H., Jr.; and Berry, Katherine S., 262,690, Cl. D8-499.000.
Berry, Patricia A.: *See—*
Berry, Garrett R.; Berry, Patricia A.; Berry, Elmer H., Jr.; and Berry, Katherine S., 262,690, Cl. D8-499.000.
Biomedical Polymers, Inc.: *See—*
Fay, John E., 262,741, Cl. D24-99.000.
Bjorn, Acton, to Dansk Pressalit A/S. Combined toilet seat and cover, or similar article. 262,733, 1-19-82, Cl. D23-71.000.
Brinley, Robert E., to Scovill Inc. Slide fastener pull tab. 262,665, 1-19-82, Cl. D2-415.000.
Bristol-Myers Company: *See—*
Nitshke, Norman L., 262,739, Cl. D24-25.000.
Brookside Corporation: *See—*
Wooden, John A., 262,734, Cl. D23-165.000.
Wooden, John A., 262,735, Cl. D23-165.000.
Wooden, John A., 262,736, Cl. D23-165.000.
Brown, Leo F.: *See—*
Williams, Robert A.; Johnson, Marshall B.; Myerly, Robert S.; and Brown, Leo F., 262,709, Cl. D15-106.000.
Cain, David E., to Halliburton Services. Density measuring balance. 262,693, 1-19-82, Cl. D10-90.000.
Cathey, Wayne C.; Kockler, Barry C.; and Clark, Albert R., to Xerox Corporation. Automatic paper feeder or similar article. 262,714, 1-19-82, Cl. D16-30.000.
Chase, David O.; and Iten, Clemens A., to American Safety Razor Company. Facial brush. 262,672, 1-19-82, Cl. D4-19.000.
Chopard & Cie S.A.: *See—*
Kurowsky, Ronald, 262,692, Cl. D10-39.000.
Cinna, Societe Anonyme: *See—*
Roset, Pierre E. C., 262,676, Cl. D6-71.000.
Clark, Albert R.: *See—*
Cathey, Wayne C.; Kockler, Barry C.; and Clark, Albert R., 262,714, Cl. D16-30.000.
Coffey, Basil J.: *See—*
Cox, Paul R.; and Coffey, Basil J., 262,711, Cl. D15-112.000.
Coles, Robert E.: *See—*
Lack, Bryan E. C.; and Coles, Robert E., 262,680, Cl. D7-6.000.
Collet, Theodore D. A. Adjustable readily detachable picture hanging device. 262,687, 1-19-82, Cl. D8-373.000.
Cosmic Wimpout Inc.: *See—*
Rice, James A., 262,725, Cl. D21-41.000.
Rice, James A., 262,726, Cl. D21-41.000.
Cox, Paul R.; and Coffey, Basil J., to Orme Polymer Engineering Limited. Beverage dispenser. 262,711, 1-19-82, Cl. D15-112.000.
Daenen, Robert H. C. M., to Dart Industries Inc. Onion scoop or the like. 262,684, 1-19-82, Cl. D7-148.000.
Dansk Pressalit A/S: *See—*
Bjorn, Acton, 262,733, Cl. D23-71.000.
Dart Industries Inc.: *See—*
Daenen, Robert H. C. M., 262,684, Cl. D7-148.000.
Davis, Michael, to Airway Industries, Inc. Luggage case. 262,669, 1-19-82, Cl. D3-71.000.
Dawson, David L. Combined bowl and sieve for popped popcorn. 262,681, 1-19-82, Cl. D7-47.000.
DeBoer, Hedde. Animal hair clipper holder. 262,678, 1-19-82, Cl. D6-130.000.
Delaine Worsted Mills, Inc.: *See—*
Tager, Milton E., 262,666, Cl. D3-23.000.
Deutschen Semperit Gesellschaft m.b.H.: *See—*
Rollinger, Geraldine, 262,697, Cl. D12-146.000.
Di Rosa, Gaetano, to F.A.T.A. European Group S.p.A. Rail for suspended monorail conveyers. 262,695, 1-19-82, Cl. D34-29.000.
Dweck, Morris, to Regency Electronics (HK) Ltd. Electronic football game housing. 262,717, 1-19-82, Cl. D21-13.000.
Dweck, Morris, to Regency Electronics (HK) Ltd. Electronic game housing. 262,718, 1-19-82, Cl. D21-13.000.
Dweck, Morris, to Regency Electronics (HK) Ltd. Electronic baseball game housing. 262,719, 1-19-82, Cl. D21-13.000.
Dweck, Morris, to Regency Electronics (HK) Ltd. Electronic basketball game housing. 262,720, 1-19-82, Cl. D21-13.000.
Dweck, Morris, to Regency Electronics (HK) Ltd. Electronic soccer game housing. 262,723, 1-19-82, Cl. D21-13.000.
Eli Lilly and Company: *See—*
Harris, Dale C., 262,746, Cl. D30-15.000.
Erickson, Bernard A., to Groom Industries, Inc. Carpet grooming tool. 262,671, 1-19-82, Cl. D4-11.000.
Erickson, M. Dallas, to Kimberly-Clark Corporation. Paper toweling or similar article. 262,747, 1-19-82, Cl. D59-2.00B.
Essex, John D., to Hoover Company, The. Suction nozzle or the like. 262,708, 1-19-82, Cl. D32-21.000.
F.A.T.A. European Group S.p.A.: *See—*
Di Rosa, Gaetano, 262,695, Cl. D34-29.000.
Fay, John E., to Biomedical Polymers, Inc. Microbiological closure. 262,741, 1-19-82, Cl. D24-99.000.
Figur, Bernd: *See—*
Stutzer, Franz A.; and Figur, Bernd, 262,744, Cl. D27-36.000.
Stutzer, Franz A.; and Figur, Bernd, 262,745, Cl. D27-42.000.
Fujitsu Limited: *See—*
Goodin, John W.; Grambush, Douglas H.; Halsted, Milton J.; and Kumagai, Katsuo, 262,705, Cl. D14-106.000.
Gageby, Steven D. Chair. 262,673, 1-19-82, Cl. D6-67.000.
General Electric Company: *See—*
Houlihan, John T., 262,699, Cl. D14-5.000.
General Foods Ltd.: *See—*
Lack, Bryan E. C.; and Coles, Robert E., 262,680, Cl. D7-6.000.
Goodin, John W.; Grambush, Douglas H.; Halsted, Milton J.; and Kumagai, Katsuo, to Fujitsu Limited. Cathode ray tube computer display. 262,705, 1-19-82, Cl. D14-106.000.
Grambush, Douglas H.: *See—*
Goodin, John W.; Grambush, Douglas H.; Halsted, Milton J.; and Kumagai, Katsuo, 262,705, Cl. D14-106.000.
Groom Industries, Inc.: *See—*
Erickson, Bernard A., 262,671, Cl. D4-11.000.
Grossag GmbH: *See—*
Assmann, Jurgen, 262,683, Cl. D7-85.000.
Hagist, Edward L. Carrier rack for pickup trucks. 262,698, 1-19-82, Cl. D12-156.000.
Halliburton Services: *See—*
Cain, David E., 262,693, Cl. D10-90.000.
Halsted, Milton J.: *See—*
Goodin, John W.; Grambush, Douglas H.; Halsted, Milton J.; and Kumagai, Katsuo, 262,705, Cl. D14-106.000.
Hamada, Masanori: *See—*
Okada, Takao; Hamada, Masanori; and Ohta, Kikuo, 262,700, Cl. D14-5.000.
Hamilton, Robert. Decorative facia plate and leg covers for a fire grate. 262,685, 1-19-82, Cl. D7-207.000.
Hardy, Douglas A.: *See—*
Nelson, Jeffery O.; and Hardy, Douglas A., 262,702, Cl. D14-100.000.
Harris, Dale C., to Eli Lilly and Company. Animal feeder. 262,746, 1-19-82, Cl. D30-15.000.
Hayashi Denki Company Ltd.: *See—*
Sugawara, Masuo; and Matsumoto, Hiroji, 262,738, Cl. D24-17.000.
Hoover Company, The: *See—*
Essex, John D., 262,708, Cl. D32-21.000.
Horsley, Ronald L. Combined vial cap and dispensing spoon. 262,691, 1-19-82, Cl. D9-338.000.
Houlihan, John T., to General Electric Company. Combined cassette recorder player and radio. 262,699, 1-19-82, Cl. D14-5.000.
Huddleston, Earl J.: *See—*
Vierling, Albert E.; Nicholson, Harry C.; and Huddleston, Earl J., 262,706, Cl. D14-106.000.
International Business Machines Corporation: *See—*
Yoshiyuki, Manabe, 262,701, Cl. D14-113.000.
Iten, Clemens A.: *See—*
Chase, David O.; and Iten, Clemens A., 262,672, Cl. D4-19.000.
Johnson, Marshall B.: *See—*
Williams, Robert A.; Johnson, Marshall B.; Myerly, Robert S.; and Brown, Leo F., 262,709, Cl. D15-106.000.
Williams, Robert A.; Johnson, Marshall B.; and Myerly, Robert S., 262,710, Cl. D15-106.000.
Jones, Garry. Lamp. 262,743, 1-19-82, Cl. D26-80.000.
Kato, Takaharu, to Ricoh Company, Ltd. Camera. 262,713, 1-19-82, Cl. D16-08.000.
Kimberly-Clark Corporation: *See—*
Erickson, M. Dallas, 262,747, Cl. D59-2.00B.
Kockler, Barry C.: *See—*
Cathey, Wayne C.; Kockler, Barry C.; and Clark, Albert R., 262,714, Cl. D16-30.000.
Kroll, Frederick H. Toy desk. 262,728, 1-19-82, Cl. D21-59.000.
Kumagai, Katsuo: *See—*
Goodin, John W.; Grambush, Douglas H.; Halsted, Milton J.; and Kumagai, Katsuo, 262,705, Cl. D14-106.000.
Kurowsky, Ronald, to Chopard & Cie S.A. Wrist watch. 262,692, 1-19-82, Cl. D10-39.000.
Lack, Bryan E. C.; and Coles, Robert E., to General Foods Ltd. Cup. 262,680, 1-19-82, Cl. D7-6.000.
Lambert, Lloyd J., Jr.; and Lambert, Lloyd J., Sr. Exercise bar for physical exerciser. 262,730, 1-19-82, Cl. D21-198.000.
Lambert, Lloyd J., Sr.: *See—*
Lambert, Lloyd J., Jr.; and Lambert, Lloyd J., Sr., 262,730, Cl. D21-198.000.
Landstingens Inkopscentral, LIC: *See—*
Wahl, Karl I., 262,740, Cl. D24-28.000.
Les Industries Provinciales Ltee.: *See—*
Morin, Andre, 262,682, Cl. D7-64.000.
Lewis, Nathaniel, Jr. Cabinet for storing reel and cartridge tapes. 262,679, 1-19-82, Cl. D6-169.000.
Logan, William F., 3rd. Folding chair. 262,674, 1-19-82, Cl. D6-69.000.
Magnavox Company, The: *See—*
Mysliwiec, Leonard J., 262,703, Cl. D14-70.000.

Matsumoto, Hiroji: *See—*
Sugawara, Masuo; and Matsumoto, Hiroji, 262,738, Cl. D24-17.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Okada, Takao; Hamada, Masanori; and Ohta, Kikuo, 262,700, Cl. D14-5.000.
Pierog, Daniel R., 262,704, Cl. D14-79.000.
Meller, Moshe, to Adimec, Advanced Mechanical Ltd. Dental air motor. 262,737, 1-19-82, Cl. D24-12.000.
Morin, Andre, to Les Industries Provinciales Ltee. Food mixing bowl. 262,682, 1-19-82, Cl. D7-64.000.
Myerly, Robert S.: *See—*
Williams, Robert A.; Johnson, Marshall B.; Myerly, Robert S.; and Brown, Leo F., 262,709, Cl. D15-106.000.
Williams, Robert A.; Johnson, Marshall B.; and Myerly, Robert S., 262,710, Cl. D15-106.000.
Mysliwiec, Leonard J., to Magnavox Company, The. Portable radio. 262,703, 1-19-82, Cl. D14-70.000.
Nelson, Jeffery O.; and Hardy, Douglas A., to Atari, Inc. Keyboard console. 262,702, 1-19-82, Cl. D14-100.000.
Nicholson, Harry C.: *See—*
Vierling, Albert E.; Nicholson, Harry C.; and Huddleston, Earl J., 262,706, Cl. D14-106.000.
Nilsson, Erik W. Holder for bags for waste products. 262,688, 1-19-82, Cl. D8-373.000.
Nitshke, Norman L., to Bristol-Myers Company. Combined syringe barrel, needle hood and cap therefor. 262,739, 1-19-82, Cl. D24-25.000.
Ohta, Kikuo: *See—*
Okada, Takao; Hamada, Masanori; and Ohta, Kikuo, 262,700, Cl. D14-5.000.
Okada, Takao; Hamada, Masanori; and Ohta, Kikuo, to Matsushita Electric Industrial Co., Ltd. Combined cassette recorder and radio receiver. 262,700, 1-19-82, Cl. D14-5.000.
Orme Polymer Engineering Limited: *See—*
Cox, Paul R.; and Coffey, Basil J., 262,711, Cl. D15-112.000.
Oy Mk-Tuote AB: *See—*
Taivalvuo, Auvo, 262,749, Cl. D99-34.000.
Perego, Giuseppe, to Perego-Pines S.p.A. Baby carriage. 262,696, 1-19-82, Cl. D12-129.000.
Perego-Pines S.p.A.: *See—*
Perego, Giuseppe, 262,696, Cl. D12-129.000.
Pierog, Daniel R., to Matsushita Electric Industrial Co., Ltd. Projection television console. 262,704, 1-19-82, Cl. D14-79.000.
Regency Electronics (HK) Ltd.: *See—*
Dweck, Morris, 262,717, Cl. D21-13.000.
Dweck, Morris, 262,718, Cl. D21-13.000.
Dweck, Morris, 262,719, Cl. D21-13.000.
Dweck, Morris, 262,720, Cl. D21-13.000.
Dweck, Morris, 262,723, Cl. D21-13.000.
Regie Nationale des Usines Renault: *See—*
Tixier, Michel, 262,748, Cl. D92-1.00W.
ReyZon Computers: *See—*
Vierling, Albert E.; Nicholson, Harry C.; and Huddleston, Earl J., 262,706, Cl. D14-106.000.
Rice, James A., to Cosmic Wimpout Inc. Game die. 262,725, 1-19-82, Cl. D21-41.000.
Rice, James A., to Cosmic Wimpout Inc. Game dice. 262,726, 1-19-82, Cl. D21-41.000.
Ricoh Company, Ltd.: *See—*
Kato, Takaharu, 262,713, Cl. D16-08.000.
Robitaille, Jacques, to Atwater Bag Corporation. Handle for a bag. 262,668, 1-19-82, Cl. D3-54.000.
Rollinger, Geraldine, to Deutschen Semperit Gesellschaft m.b.H. Tire. 262,697, 1-19-82, Cl. D12-146.000.
Roset, Pierre E. C., to Cinna, Societe Anonyme. Chair. 262,676, 1-19-82, Cl. D6-71.000.
Rowenta-Werke, GmbH: *See—*
Stutzer, Franz A.; and Figur, Bernd, 262,744, Cl. D27-36.000.
Stutzer, Franz A.; and Figur, Bernd, 262,745, Cl. D27-42.000.
Rowland, David L. Armchair. 262,675, 1-19-82, Cl. D6-69.000.
Rowland, David L. Chair. 262,677, 1-19-82, Cl. D6-75.000.
Santee, Dwight R. Game board. 262,724, 1-19-82, Cl. D21-25.000.
Schlagheck, Norbert; Schultes, Herbert; and Segers, Hermann R., to Agfa-Gevaert AG. Electronic flash unit. 262,715, 1-19-82, Cl. D16-42.000.
Schlagheck, Norbert; Schultes, Herbert; and Segers, Hermann R., to Agfa-Gevaert AG. Electronic flash unit. 262,716, 1-19-82, Cl. D16-42.000.
Schultes, Herbert: *See—*
Schlagheck, Norbert; Schultes, Herbert; and Segers, Hermann R., 262,715, Cl. D16-42.000.
Schlagheck, Norbert; Schultes, Herbert; and Segers, Hermann R., 262,716, Cl. D16-42.000.
Scovill Inc.: *See—*
Brinley, Robert E., 262,665, Cl. D2-415.000.
Segers, Hermann R.: *See—*
Schlagheck, Norbert; Schultes, Herbert; and Segers, Hermann R., 262,715, Cl. D16-42.000.
Schlagheck, Norbert; Schultes, Herbert; and Segers, Hermann R., 262,716, Cl. D16-42.000.
Serwatowski, Frank J. Vehicle transportable cordwood cutting machine. 262,712, 1-19-82, Cl. D15-133.000.
Snyder, William J. Holder tray for game pieces or the like. 262,727, 1-19-82, Cl. D21-54.000.
Solomon, Joe. Digital scale. 262,694, 1-19-82, Cl. D10-93.000.
Stutzer, Franz A.; and Figur, Bernd, to Rowenta-Werke, GmbH. Lighter. 262,744, 1-19-82, Cl. D27-36.000.
Stutzer, Franz A.; and Figur, Bernd, to Rowenta-Werke, GmbH. Lighter. 262,745, 1-19-82, Cl. D27-42.000.
Sugawara, Masuo; and Matsumoto, Hiroji, to Hayashi Denki Company Ltd. Blood flow detector. 262,738, 1-19-82, Cl. D24-17.000.
Tager, Milton E., to Delaine Worsted Mills, Inc. Hand knitter's support stand for yarn packages. 262,666, 1-19-82, Cl. D3-23.000.
Taivalvuo, Auvo, to Oy Mk-Tuote AB. Coin receptacle. 262,749, 1-19-82, Cl. D99-34.000.
Thompson, Billy D. Gas carburetor. 262,707, 1-19-82, Cl. D15-6.000.
Thompson, David D. Shoe tie stand. 262,667, 1-19-82, Cl. D3-30.500.
Tixier, Michel, to Regie Nationale des Usines Renault. Fabric or the like. 262,748, 1-19-82, Cl. D92-1.00W.
Tomy Kogyo Co., Inc.: *See—*
Tsuyuki, Akio, 262,721, Cl. D21-13.000.
Tsuyuki, Akio, 262,722, Cl. D21-13.000.
Tsuyuki, Akio, to Tomy Kogyo Co., Inc. Electronic soccer game housing. 262,721, 1-19-82, Cl. D21-13.000.
Tsuyuki, Akio, to Tomy Kogyo Co., Inc. Electronic basketball game housing. 262,722, 1-19-82, Cl. D21-13.000.
U.S. Industrial Tool & Supply Co.: *See—*
Wellin, Martin, 262,670, Cl. D4-02.000.
Vesterholt, Jorgen K. Pavement block. 262,742, 1-19-82, Cl. D25-92.000.
Vierling, Albert E.; Nicholson, Harry C.; and Huddleston, Earl J., to ReyZon Computers. Combined terminal and self-contained computer system. 262,706, 1-19-82, Cl. D14-106.000.
Wahl, Karl I., to Landstingens Inkopscentral, LIC. Cutting wire for plaster-of-paris bandage. 262,740, 1-19-82, Cl. D24-28.000.
Warren, John E.; and Warren, Richard. Rodent trap. 262,732, 1-19-82, Cl. D22-18.000.
Warren, Richard: *See—*
Warren, John E.; and Warren, Richard, 262,732, Cl. D22-18.000.
Wear-Ever Aluminum, Inc.: *See—*
Williams, Robert A.; Johnson, Marshall B.; Myerly, Robert S.; and Brown, Leo F., 262,709, Cl. D15-106.000.
Williams, Robert A.; Johnson, Marshall B.; and Myerly, Robert S., 262,710, Cl. D15-106.000.
Wellin, Martin, to U.S. Industrial Tool & Supply Co. Air powered rotary scrubbing brush. 262,670, 1-19-82, Cl. D4-02.000.
Williams, Robert A.; Johnson, Marshall B.; Myerly, Robert S.; and Brown, Leo F., to Wear-Ever Aluminum, Inc. Vertical rotisserie. 262,709, 1-19-82, Cl. D15-106.000.
Williams, Robert A.; Johnson, Marshall B.; and Myerly, Robert S., to Wear-Ever Aluminum, Inc. Base and cover for a vertical rotisserie. 262,710, 1-19-82, Cl. D15-106.000.
Wooden, John A., to Brookside Corporation. Fan spider. 262,734, 1-19-82, Cl. D23-165.000.
Wooden, John A., to Brookside Corporation. Fan. 262,735, 1-19-82, Cl. D23-165.000.
Wooden, John A., to Brookside Corporation. Fan blade. 262,736, 1-19-82, Cl. D23-165.000.
Xerox Corporation: *See—*
Cathey, Wayne C.; Kockler, Barry C.; and Clark, Albert R., 262,714, Cl. D16-30.000.
Yoshiyuki, Manabe, to International Business Machines Corporation. Computer display. 262,701, 1-19-82, Cl. D14-113.000.

LIST OF PLANT PATENTEES

Carlton Nursery Company, Inc.: *See—*
Garretson, John W., 4,801, Cl. 35.000.
Conard-Pyle Company, The: *See—*
Meserve, Kathleen K., 4,803, Cl. 65.000.
Meserve, Kathleen K., 4,804, Cl. 65.000.
D. Hill Nursery: *See—*
Hill, Platt W., 4,802, Cl. 50.000.
Ecke, Paul, Jr., to Paul Ecke Ranch. Poinsettia named V-14 Pink. 4,808, 1-19-82, Cl. 86.000.
Ecke, Paul, Jr., to Paul Ecke Ranch. Poinsettia named V-10 White. 4,809, 1-19-82, Cl. 86.000.

Ecke, Paul, Jr., to Paul Ecke Ranch. Poinsettia named V-10 Marble. 4,810, 1-19-82, Cl. 86.000.
Garretson, John W., to Carlton Nursery Company, Inc. Apple tree. 4,801, 1-19-82, Cl. 35.000.
Hill, Platt W., to D. Hill Nursery. Burn-resistant Japanese Yew. 4,802, 1-19-82, Cl. 50.000.
Hope, Claude, to Pan-American Plant Company. Kalanchoe named Warrior. 4,806, 1-19-82, Cl. 68.000.
Jackson & Perkins Company: *See*—
Kordes, Reimer, 4,798, Cl. 11.000.
Tantau, Mathias, 4,799, Cl. 15.000.
Kordes, Reimer, to Jackson & Perkins Company. Rose plant—JP 435. 4,798, 1-19-82, Cl. 11.000.
LaMont, George, to Stark Brothers Nurseries & Orchards Company. Compact Cortland apple tree—LaMont cultivar. 4,800, 1-19-82, Cl. 34.000.
Meserve, Kathleen K., to Conard-Pyle Company, The. Ilex plant—Mesdob variety. 4,803, 1-19-82, Cl. 65.000.
Meserve, Kathleen K., to Conard-Pyle Company. Ilex plant—Mesan variety. 4,804, 1-19-82, Cl. 65.000.
Pan-American Plant Company: *See*—
Hope, Claude, 4,806, Cl. 68.000.
Shoesmith, Leonard H., 4,807, Cl. 74.000.
Paul Ecke Ranch: *See*—
Ecke, Paul, Jr., 4,808, Cl. 86.000.
Ecke, Paul, Jr., 4,809, Cl. 86.000.
Ecke, Paul, Jr., 4,810, Cl. 86.000.
Shoesmith, Leonard H., to Pan-American Plant Company. Chrysanthemum named Hawkeye. 4,807, 1-19-82, Cl. 74.000.
Stark Brothers Nurseries & Orchards Company: *See*—
LaMont, George, 4,800, Cl. 34.000.
Stokes, Brian T. *Crossandra infundibuliformis* 'Diane'. 4,805, 1-19-82, Cl. 68.000.
Tantau, Mathias, to Jackson & Perkins Company. Rose plant. 4,799, 1-19-82, Cl. 15.000.
Weeks, O. L. Rose plant. 4,796, 1-19-82, Cl. 2.000.
Weeks, O. L. Rose plant. 4,797, 1-19-82, Cl. 3.000.

LIST OF PLANT PATENTEES

CLASSIFICATION OF PATENTS

ISSUED JANUARY 19, 1982

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

69.5 4,310,925
81 4,310,926
115 4,310,927
161 R 4,310,928
238 4,310,929

CLASS 3

1.7 4,310,930
1.913 4,310,931
28 4,310,932

CLASS 4

286 4,310,933
321 4,310,934

CLASS 5

80 4,310,935
450 4,310,936

CLASS 8

407 4,311,478
495 4,311,479
527 4,311,480
564 4,311,481

CLASS 9

8 P 4,310,937
309 4,310,938

CLASS 10

86 B 4,310,939

CLASS 15

105 4,310,940
160 4,310,941
162 4,310,942
250.01 4,310,943
346 4,310,944
347 4,310,945
363 4,310,946

CLASS 16

83 4,310,947
335 4,310,948

CLASS 19

62 R 4,310,949
202 4,310,950

CLASS 23

230 B 4,311,482
4,311,483
230 R 4,311,485
301 4,311,486
305 RE 4,311,487

CLASS 24

68 SK 4,310,951
230 A 4,310,952
4,310,954
230 AL 4,310,953
248 B 4,310,955
279 4,310,956

CLASS 29

25.35 4,310,957
26 A 4,310,958
91.1 4,310,959
157.3 R 4,310,960
408 4,310,961
417 4,310,962
460 4,310,963
469 4,310,964
580 4,310,965
596 4,310,966
749 Re.30,848
4,310,967

CLASS 30

34.2 4,310,968
113.1 4,310,969
276 4,310,970
279 R 4,310,971
382 4,310,972

CLASS 34

10 4,310,973

CLASS 37

71 4,310,975

CLASS 40

152.1 4,310,976
518 4,310,977
600 4,310,978
607 4,310,979

CLASS 42

1 ST 4,310,980
42 R 4,310,981
75 B 4,310,982

CLASS 43

17 4,310,983
61 4,310,984
131 4,310,985

CLASS 44

10 R 4,311,488

CLASS 46

189 4,310,986
251 4,310,987

CLASS 47

1.5 4,310,988
40.5 4,310,989
59 4,310,990

CLASS 49

470 4,310,991

CLASS 51

298 4,311,489
307 4,311,490

CLASS 52

309.11 4,310,992
473 4,310,993
608 4,310,994
806 4,310,995
809 4,310,996

CLASS 55

2 4,311,491
158 4,311,492
369 4,311,493
394 4,311,494

CLASS 56

15.9 4,310,997
202 4,310,998
295 4,310,999

CLASS 57

6 4,311,000
215 4,311,001
293 4,311,002

CLASS 59

16 4,311,003

CLASS 60

39.05 4,311,004
253 4,311,005
385 4,311,006
562 4,311,007
602 4,311,008
605 4,311,009
641.15 4,311,011
641.7 4,311,012
641.8 4,311,010
646 4,311,013
649 4,311,014
675 4,311,015
687 4,311,016

CLASS 62

3 4,311,017
17 4,311,495
4,311,496
55.5 4,311,018
101 4,311,019
158 4,311,497
181 4,311,498
324.6 4,311,020
402 4,311,021
457 4,311,022
468 4,311,023
474 4,311,024
502 4,311,025

CLASS 63

15 4,311,026

CLASS 64

23.7 4,311,027
28 R 4,311,028

CLASS 65

1 4,311,499
2 4,311,500
3.11 4,311,501
27 4,311,502
29 4,311,503
32 4,311,504
43 4,311,505
59.6 4,311,506
114 4,311,507
182.5 4,311,508
351 4,311,509

CLASS 66

75.2 4,311,029

CLASS 71

9 4,311,510
4,311,511
67 4,311,512
92 4,311,513
94 4,311,514
108 4,311,515
111 4,311,516
121 4,311,517

CLASS 72

8 4,311,030
133 4,311,031
208 4,311,032
224 4,311,033
318 4,311,034

CLASS 73

1 D 4,311,035
10 4,311,036
38 4,311,037
49.8 4,311,038
61.4 4,311,039
115 4,311,040
117.3 4,311,041
118 4,311,042
119 A 4,311,043
146 4,311,044
170 A 4,311,045
178 R 4,311,046
204 4,311,047
293 4,311,048
362.4 4,311,049
427 4,311,050
517 R 4,311,051
634 4,311,052
704 4,311,053
861.38 4,311,054
862.08 4,311,055
864.21 4,311,484

CLASS 74

10.85 4,311,056
18.1 4,311,057
89 4,311,058
116 4,311,059
142 4,311,060
190.5 4,311,061
333 4,311,062
395 4,311,063
473 R 4,311,064
571 M 4,311,065
687 4,311,066
718 4,311,067
733 4,311,068

CLASS 75

59 4,311,518
72 4,311,519
80 4,311,520
101 BE 4,311,521
153 4,311,522
175.5 4,311,523
231 4,311,524
240 4,311,525
255 4,311,526

CLASS 81

3 J 4,311,069
77 4,311,070
436 4,311,071
476 4,311,072

CLASS 83

23 4,311,073
816 4,311,074
848 4,311,075

CLASS 84

1.03 4,311,076
4,311,077
314 R 4,311,078

CLASS 87

6 4,311,079
44 4,311,080

CLASS 89

33 SF 4,311,081
191 R 4,311,082

CLASS 91

19 4,311,083
188 4,311,084
391 R 4,311,085

CLASS 92

10 4,311,086

CLASS 99

456 4,311,087
470 4,311,088
568 4,311,089

CLASS 100

3 4,311,090
161 4,311,091
214 4,311,092

CLASS 101

232 4,311,093
425 4,311,094
426 4,311,095

CLASS 102

202.13 4,311,096
229 4,311,097

CLASS 105

226 4,311,098

CLASS 106

22 4,311,527
35 4,311,528
84 4,311,530

CLASS 108

47 4,311,099
111 4,311,100
152 4,311,101

CLASS 110

103 4,311,102
238 4,311,103

CLASS 111

85 4,311,104

CLASS 112

199 4,311,105
313 4,311,106

CLASS 114

39 4,311,107
61 4,311,108
220 4,311,109

CLASS 118

50.1 4,311,110
56 4,311,111
408 4,311,112
629 4,311,113
694 4,311,114

CLASS 119

1 4,311,115
15.5 A 4,311,116
75 4,311,117

CLASS 123

25 A 4,311,118
80 BB 4,311,119
192 B 4,311,120
228 4,311,121
279 4,311,122
325 4,311,123
333 4,311,124
364 4,311,125
438 4,311,126
557 4,311,127
4,311,128
588 4,311,129

CLASS 126

25 B 4,311,130
433 4,311,131
438 4,311,132

CLASS 128

1 D 4,311,133
6 4,311,134
24 R 4,311,135
214.4 4,311,136
4,311,137
4,311,138
4,311,139
276 4,311,140
281 4,311,141
303.1 4,311,142
303.15 4,311,143
4,311,144
303.17 4,311,145
325 4,311,146
328 4,311,147
348 4,311,148
359 4,311,149
494 4,311,150
635 4,311,151
641 4,311,152
785 4,311,153
804 4,311,154

CLASS 131

274 4,311,156
280 4,311,155

CLASS 134

10 4,311,531
125 4,311,157
138 4,311,158

CLASS 135

1 R 4,311,159

CLASS 136

246 4,311,869
261 4,311,870

CLASS 137

111 4,311,160
117 4,311,161
185 4,311,162
218 Re.30,849
315 4,311,163
4,311,164
355.12 4,311,165
375 4,311,166
454.2 4,311,167
549 4,311,168
556 4,311,169
614.17 4,311,170
625.23 4,311,171

CLASS 139

383 A 4,311,172

CLASS 141

68 4,311,173
383 4,311,174

CLASS 144

241 4,311,175
268 4,311,176
310 R 4,311,177

CLASS 148

1.5 4,311,532
4,311,533
4,311,534
6.15 R 4,311,536
6.15 Z 4,311,535
12 C Re.30,851
108 4,311,537
112 4,311,538
121 4,311,539

CLASS 150

1.5 R 4,311,178

CLASS 152

209 R 4,311,179
330 RF 4,311,180
353 R 4,311,181

CLASS 156

73.1 4,311,540
78 4,311,541
84 4,311,542
224 4,311,543
244.13 4,311,547
287 4,311,548
308.2 4,311,549
510 4,311,544
555 4,311,550
613 4,311,545
640 4,311,551
643 4,311,546

CLASS 157

13 4,311,182

CLASS 160

37 4,311,183

CLASS 162

5 4,311,552
23 4,311,553
159 4,311,554
206 4,311,555

CLASS 164

165 4,311,184
315 4,311,185
453 4,311,186

CLASS 165

1 4,311,187
2 4,311,188
11 R 4,311,189
25 4,311,190
29 4,311,191
4,311,192
149 4,311,193

CLASS 166

120 4,311,194
4,311,195
134 4,311,196
373 4,311,197

CLASS 169

11 4,311,198
48 4,311,199

CLASS 172

826 4,311,200

CLASS 174

74 A 4,311,871

CLASS 175

44 4,311,201

CLASS 177

212 4,311,202

CLASS 179

1 CN 4,311,874
1 D 4,311,873
1 R 4,311,872
2 A 4,311,875
15.5 ST 4,311,876
15.55 R 4,311,877
16 EC 4,311,878
18 AH 4,311,879
99 H 4,311,880
111 R 4,311,881
175.2 D 4,311,882
189 R 4,311,883

CLASS 180

24 4,311,203
54 R 4,311,204
68.5 4,311,205

CLASS 181

135 4,311,206

CLASS 182

18 4,311,208
206 4,311,207
4,311,209
214 4,311,210

CLASS 186

53 4,311,211

CLASS 187

29 A 4,311,212

CLASS 188

1.11 4,311,214

8 4,311,215
18 A 4,311,216
65.2 4,311,217
65.4 4,311,218
71.8 4,311,219
170 4,311,220
259 4,311,221
380 4,311,213

CLASS 190

18 A 4,311,222
51 4,311,223

CLASS 192

56 R 4,311,224
142 R 4,311,225

CLASS 193

35 R 4,311,226

CLASS 194

4 C 4,311,227

CLASS 196

14.52 4,311,561

CLASS 198

422 4,311,228
457 4,311,229
4,311,230
781 4,311,231

CLASS 200

5 R 4,311,884
16 C 4,311,885
38 R 4,311,886
42 T 4,311,887
52 R 4,311,888
4,311,889
61.08 4,311,890
61.45 R 4,311,891
81.4 4,311,892
340 4,311,893
4,311,894

CLASS 203

7 4,311,562
46 4,311,563
99 4,311,564

CLASS 204

73 R 4,311,565
98 4,311,566
4,311,567
128 4,311,568
129 4,311,569
157.1 R 4,311,570
158 R 4,311,572
158 S 4,311,571
159.15 4,311,573
180 P 4,311,574
4,311,575
196 4,311,576
255 4,311,577

CLASS 206

0.7 4,311,232
45.25 4,311,233
354 4,311,234
483 4,311,235
488 4,311,236
503 4,311,237
508 4,311,238
597 4,311,239

CLASS 208

8 LE 4,311,578
73 4,311,579
91 4,311,580
115 4,311,581
139 4,311,582
312 4,311,583

CLASS 209

12 4,311,584
169 4,311,240
211 4,311,585
570 4,311,241
668 4,311,242

CLASS 210

101 4,311,586
136 4,311,587
169 4,311,588
177 4,311,589
360.2 4,311,590
405 4,311,591
416.2 4,311,592
603 4,311,593
640 4,311,594
671 4,311,595
711 4,311,596
731 4,311,597
757 4,311,598
4,311,599

CLASS 211

113 4,311,243

CLASS 213

86 4,311,244

CLASS 215

11 B 4,311,245
100 A 4,311,246
232 4,311,247

CLASS 219

10.55 B 4,311,895
10.57 4,311,896
121 PP 4,311,897
378 4,311,898
461 4,311,899
535 4,311,900

CLASS 220

268 4,311,249
458 4,311,250

CLASS 221

24 4,311,251
57 4,311,252

CLASS 222

145 4,311,254
183 4,311,255
321 4,311,256
387 4,311,257
391 4,311,258
525 4,311,259

CLASS 223

63 4,311,260

CLASS 224

31 4,311,261
150 4,311,263
257 4,311,264

CLASS 228

40 4,311,265
4,311,266
180 A 4,311,267

CLASS 229

9 4,311,268
28 R 4,311,269

CLASS 233

46 4,311,270

CLASS 235

12 4,311,901
78 R 4,311,902
88 R 4,311,903

CLASS 236

12 R 4,311,271
59 4,311,272

CLASS 238

1 4,311,273

CLASS 239

4,311,274
102 4,311,275
265.39 4,311,276
400 4,311,277
419.3 4,311,278
562 4,311,279
585 4,311,280

CLASS 241

46 R 4,311,281
56 4,311,282
95 4,311,283
191 4,311,284

CLASS 242

18 PW 4,311,285
55.19 A 4,311,286
68.3 4,311,287
86.5 R 4,311,288

CLASS 244

55 4,311,289
110 R 4,311,290
211 4,311,291

CLASS 248

48.2 4,311,292
49 4,311,293
165 4,311,294
221.3 4,311,295

CLASS 250

204 4,311,904
321 4,311,905
349 4,311,906
368 4,311,907
374 4,311,908
4,311,909
409 4,311,913
423 R 4,311,910
445 T 4,311,911
556 4,311,914
561 4,311,915
4,311,916

CLASS 251

29 4,311,296
63.6 4,311,297
144 4,311,298

CLASS 252

8.5 C 4,311,600
8.6 4,311,601
4,311,602
70 4,311,603
90 4,311,604
102 4,311,605
135 4,311,606
140 4,311,607
143 4,311,608
179 4,311,609
299.61 4,311,610
412 4,311,611
429 E 4,311,612
429 R 4,311,613
466 FT 4,311,614
514 4,311,615
522 R 4,311,616
4,311,617
542 4,311,618

CLASS 254

134.3 CL 4,311,299

CLASS 256

1 4,311,300

CLASS 260

7 4,311,619
9 4,311,620
17.2 4,311,621
18 EP 4,311,622
18 S 4,311,623
22 CB 4,311,624
22 R 4,311,625
29.2 M 4,311,626
30.4 R 4,311,627
33.6 AQ 4,311,628
33.6 SB 4,311,629
38 4,311,630
4,311,631
42.18 4,311,633
42.27 4,311,634
42.49 4,311,635
45.8 N 4,311,636
45.85 B 4,311,637
112.5 R 4,311,639
4,311,640
145 A 4,311,641
239.3 A 4,311,642
314 4,311,643
330 4,311,638
346.22 4,311,644
348.61 4,311,645
397.4 4,311,646
453 RW 4,311,647
4,311,648
455 A 4,311,649
458 R 4,311,650
543 H 4,311,651
969 4,311,652

CLASS 261

39 A 4,311,653

CLASS 264

2.3 4,311,654
22 4,311,655
36 4,311,656
40.5 4,311,632
171 4,311,657
175 4,311,658
221 4,311,659
342 RE 4,311,660
510 4,311,661

CLASS 266

196 4,311,301

CLASS 267

64.23 4,311,302
160 4,311,303

CLASS 271

13 4,311,304

CLASS 272

118 4,311,305
130 4,311,306

CLASS 273

65 B 4,311,307
73 G 4,311,308
85 B 4,311,309
109 4,311,310
121 A 4,311,311
195 A 4,311,312

CLASS 277

1 4,311,316
27 4,311,313
34 4,311,314
95 4,311,315
206 R 4,311,248
212 C 4,311,317
235 B 4,311,318

CLASS 280

11.28 4,311,319
163 4,311,320
611 4,311,321
656 4,311,322
801 4,311,323
810 4,311,324

CLASS 282

11.5 A 4,311,325

CLASS 285

62 4,311,326
136 4,311,327
308 4,311,328

CLASS 290

1 A 4,311,917
55 4,311,918

CLASS 292

92 4,311,329
210 4,311,330
336.3 4,311,331

CLASS 294

50.9 4,311,332
141 4,311,262
147 4,311,333

CLASS 296

1 S 4,311,334
78.1 4,311,335
201 4,311,336

CLASS 297

249 4,311,337
411 4,311,338
487 4,311,339

CLASS 299

4 4,311,340
5 4,311,341
8 4,311,342
22 4,311,343
33 4,311,344

CLASS 303

84 A 4,311,345

CLASS 305

11 4,311,346

CLASS 307

64 4,311,919
66 4,311,920
261 4,311,921
270 4,311,922
304 4,311,923
354 4,311,924
455 4,311,925
466 4,311,926
473 4,311,927
498 4,311,928
529 4,311,929
575 4,311,930

CLASS 308

3.9 4,311,347
6 C 4,311,348
122 4,311,349
160 4,311,350

CLASS 310

55 4,311,931
61 4,311,932
156 4,311,933
216 4,311,934
227 4,311,935
242 4,311,936
268 4,311,937
311 4,311,938

CLASS 312

236 4,311,351

CLASS 313

95 4,311,939
273 4,311,940
336 4,311,941

CLASS 315

62 4,311,942
70 4,311,943
375 4,311,944

CLASS 318

561 4,311,945
663 4,311,946
696 4,311,947
718 4,311,950
759 4,311,948
778 4,311,951
799 4,311,949

CLASS 320

2 4,311,953
3 4,311,952

CLASS 322

25 4,311,253

CLASS 323

222 4,311,954
300 4,311,955
4,311,956

CLASS 324

58.5 R 4,311,957
61 P 4,311,959
61 R 4,311,958
103 P 4,311,960
418 4,311,961

CLASS 326

173 4,311,818

CLASS 328

120 4,311,962
163 4,311,963

CLASS 329

104 4,311,964

CLASS 330

124 R 4,311,965
286 4,311,966
288 4,311,967

CLASS 331

90 4,311,968
94.5 D 4,311,969
107 R 4,311,970

CLASS 332

9 R 4,311,971

CLASS 333

17 M 4,311,972
33 4,311,973
112 4,311,974
207 4,311,975

CLASS 335

78 4,311,976

CLASS 336

69 4,311,977
92 4,311,978
205 4,311,979

CLASS 338

4 4,311,980
32 H 4,311,981
195 4,311,982

CLASS 339

18 R 4,311,352
22 R 4,311,353
36 4,311,354
94 R 4,311,355
99 R 4,311,356

CLASS 340

51 4,311,983
58 4,311,984
4,311,985
347 DA 4,311,988
347 DD 4,311,989
347 P 4,311,987
365 P 4,311,990
365 R 4,311,991
572 4,311,992
641 4,311,993
661 4,311,994
684 4,311,995
711 4,311,996
722 4,311,997
731 4,311,998
755 4,311,999
785 4,312,000
825.63 4,311,986
870.16 4,312,001

CLASS 343

725 4,312,002
788 4,312,003

CLASS 346

1.1 4,312,004
75 4,312,005
136 4,312,006
140 R 4,312,007
4,312,008
4,312,009
4,312,010

CLASS 350

6.9 4,311,357
91 4,311,358
96.20 4,311,359
174 4,311,360
267 4,311,361
293 4,311,362
299 4,311,363
318 4,311,364
399 4,311,365
445 4,311,366
461 4,311,367

CLASS 351

165 4,311,368

CLASS 352

91 C 4,311,369

CLASS 353

27 R 4,311,370

CLASS 354

33 4,311,372
34 4,311,371
43 4,311,373
60 R 4,311,375
144 4,311,374
153 4,311,376
217 4,311,377
4,311,378
313 4,311,379
322 4,311,380

CLASS 355

100 4,311,381

CLASS 356

5 4,311,382
28.5 4,311,383
152 4,311,384
4,311,385
155 4,311,386
318 4,311,387
341 4,311,388
354 4,311,389
358 4,311,390
361 4,311,391
375 4,311,392
407 4,311,393
440 4,311,394

CLASS 357

46 4,312,011
82 4,312,012

CLASS 358

8 4,312,013
41 4,312,014
139 4,312,015
188 4,312,016
214 4,312,017
261 4,312,018

CLASS 360

22 4,312,019
65 4,312,020
132 4,312,021

CLASS 361

46 4,312,022
243 4,312,023
271 4,312,024
289 4,312,025
321 4,312,026
329 4,312,027

CLASS 362

369 4,312,028

CLASS 363

21 4,312,029
41 4,312,030
4,312,031
97 4,312,032

CLASS 364

167 4,312,033
200 4,312,034
4,312,035
4,312,036
405 4,312,037
422 4,312,040
431.12 4,312,038
434 4,312,039
442 4,312,041
463 4,312,042
551 4,312,043
554 4,312,044
900 4,312,045

CLASS 365

104 4,312,046
189 4,312,047
195 4,312,048

CLASS 366

27 4,311,395
51 4,311,396
98 4,311,397

CLASS 367

35 4,312,049

44 4,312,050
68 4,312,051
75 4,312,052
127 4,312,053
134 4,312,054

CLASS 368

29 4,312,055
62 4,312,056
63 4,312,057
66 4,312,058
80 Re.30,852
157 4,312,059

CLASS 369

134 4,312,060
216 4,312,061

CLASS 370

50 4,312,062
68 4,312,063
71 4,312,064
94 4,312,065

CLASS 371

16 4,312,066
25 4,312,067
37 4,312,068
4,312,069
40 4,312,070
57 4,312,071

CLASS 375

1 4,312,072
19 4,312,073
96 4,312,074
106 4,312,075

CLASS 376

109 4,311,912
225 4,311,560
249 4,311,556
271 4,311,557
296 4,311,558
432 4,311,559

CLASS 400

70 4,311,398
76 4,311,399
166 4,311,400
248 4,311,401

CLASS 401

78 4,311,402
209 4,311,403
287 4,311,404

CLASS 403

142 4,311,405
161 4,311,406
197 Re.30,850
390 4,311,407

CLASS 404

104 4,311,408

CLASS 405

52 4,311,409
78 4,311,410
184 4,311,411
212 4,311,412
219 4,311,413
227 4,311,414
228 4,311,415
232 4,311,416
297 4,311,417

CLASS 407

39 4,311,418

CLASS 408

1 R 4,311,419

CLASS 410

121 4,311,420

CLASS 411

59 4,311,421
112 4,311,422
387 4,311,423

CLASS 414

27 4,311,424
84 4,311,425
133 4,311,426
217 4,311,427
723 4,311,428
750 4,311,429
786 4,311,430

CLASS 415

134 4,311,432
172 A 4,311,431

CLASS 416

97 A 4,311,433
142 4,311,434
170 R 4,311,435

CLASS 417

2 4,311,436
12 4,311,438
273 4,311,437
313 4,311,439
360 4,311,440
383 4,311,441

CLASS 418

37 4,311,442
48 4,311,443
74 4,311,444
132 4,311,445

CLASS 422

12 4,311,662
4,311,663
54 4,311,664
56 4,311,665
62 4,311,666
64 4,311,667
70 4,311,668
98 4,311,669
145 4,311,670
148 4,311,671
150 4,311,672
272 4,311,673

CLASS 423

3 4,311,674
8 4,311,675
10 4,311,676
18 4,311,677
19 4,311,678
55 4,311,679
230 4,311,680
321 S 4,311,681
448 4,311,682
573 G 4,311,683
632 4,311,684

CLASS 424

1 4,311,685
4,311,686
4,311,687
4,311,688
4,311,689
4,311,690
48 4,311,691
70 4,311,692
122 4,311,693
180 4,311,694
184 4,311,695
226 4,311,696
240 4,311,697
246 4,311,698
4,311,699
248.54 4,311,700
249 4,311,701
256 4,311,702
263 4,311,703
274 4,311,704
4,311,705
301 4,311,706
305 4,311,707
330 4,311,708
4,311,709
4,311,710
346 4,311,711
365 4,311,712

CLASS 425

144 4,311,446

CLASS 426

2 4,311,713
28 4,311,714
46 4,311,715
275 4,311,716
330.2 4,311,717
538 4,311,718
557 4,311,719
594 4,311,720
623 4,311,721
660 4,311,722

CLASS 427

8 4,311,724
10 4,311,725
14.1 4,311,723
54.1 4,311,726
58 4,311,727
74 4,311,728
80 4,311,729
102 4,311,730
162 4,311,731
164 4,311,732
230 4,311,733
245 4,311,734
295 4,311,735
331 4,311,736
386 4,311,737
387 4,311,739
428 4,311,740

CLASS 428

35 4,311,741
4,311,742
64 4,311,743
83 4,311,744
91 4,311,745
110 4,311,746
122 4,311,747
204 4,311,748
209 4,311,749
212 4,311,750
4,311,751
220 4,311,752
251 4,311,753
282 4,311,756
284 4,311,754
312.6 4,311,755
323 4,311,757
341 4,311,758
345 4,311,759
391 4,311,760
397 4,311,761
412 4,311,762
4,311,763
423.1 4,311,764
425.8 4,311,765
514 4,311,766
537 4,311,767
626 4,311,768
642 4,311,769
694 4,311,770

CLASS 429

51 4,311,771
193 4,311,772

CLASS 430

7 4,311,773
14 4,311,774
37 4,311,775
48 4,311,776
4,311,777
54 4,311,778
107 4,311,779
125 4,311,780
264 4,311,781
270 4,311,782
4,311,783
271 4,311,784
283 4,311,785
411 4,311,786
522 4,311,787

CLASS 431

7 4,311,447
14 4,311,448
284 4,311,449
344 4,311,450
352 4,311,451
4,311,452
362 4,311,453

CLASS 432

11 4,311,454
18 4,311,455
30 4,311,456
121 4,311,458
222 4,311,457
247 4,311,459
4,311,460

CLASS 433

18 4,311,463
33 4,311,461
184 4,311,462

CLASS 434

42 4,310,974
74 4,311,464
157 4,311,465
242 4,311,466
264 4,311,467
286 4,311,468
404 4,311,469

CLASS 435

7 4,311,788
10 4,311,789
15 4,311,790
26 4,311,791
30 4,311,792
31 4,311,793
32 4,311,794
101 4,311,795
104 4,311,796
172 4,311,797
286 4,311,798

CLASS 440

6 4,311,470
63 4,311,471
75 4,311,472

CLASS 474

160 4,311,473
205 4,311,474

CLASS 493

142 4,311,475
176 4,311,476
195 4,311,477

CLASS 501

32 4,311,529

CLASS 521

31 4,311,799
109 4,311,800
110 4,311,801
133 4,311,802

CLASS 525

53 4,311,803
58 4,311,804
60 4,311,805
71 4,311,806
197 4,311,807
222 4,311,808
286 4,311,809
321 4,311,810
332 4,311,811
337 4,311,812
348 4,311,813
438 4,311,814
504 4,311,815

CLASS 526

116 4,311,816
124 4,311,817
173 4,311,819
265 4,311,820

CLASS 528

15 4,311,821
176 4,311,822
181 4,311,823
190 4,311,824
232 4,311,825
389 4,311,826
405 4,311,827
483 4,311,828

CLASS 536

18 4,311,829
53 4,311,830
4,311,831
4,311,832
90 4,311,833

CLASS 542

429 4,311,834
4,311,835
443 4,311,836

CLASS 544

26 4,311,837
27 4,311,842
54 4,311,838
135 4,311,839
223 4,311,840
225 4,311,843
231 4,311,841

CLASS 546

84 4,311,844
114 4,311,845
226 4,311,846

CLASS 548

207 4,311,847

CLASS 549

63 4,311,849

CLASS 560

131 4,311,850
233 4,311,851
256 4,311,852

CLASS 562

447 4,311,853
531 4,311,854

CLASS 564

12 4,311,855
67 4,311,856
212 4,311,857
214 4,311,858
491 4,311,859

CLASS 568

378 4,311,860
659 4,311,861
689 4,311,862

CLASS 570

170 4,311,863

CLASS 585

530 4,311,864
640 4,311,865
719 4,311,866
736 4,311,867
747 4,311,868

CLASSIFICATION OF DESIGNS

D2— 415 262,665
D3— 23 262,666
30.5 262,667
54 262,668
71 262,669
D4— 02 262,670
11 262,671
19 262,672
D6— 67 262,673
69 262,674
262,675
71 262,676
75 262,677
130 262,678
169 262,679
D7— 6 262,680
47 262,681
64 262,682
85 262,683
148 262,684
207 262,685
210 262,686
D8— 373 262,687
262,688
396 262,689
499 262,690
D9— 338 262,691
D10— 39 262,692
90 262,693
93 262,694
D12— 129 262,696
146 262,697
156 262,698
D14— 5 262,699
262,700
70 262,703
79 262,704
100 262,702
106 262,705
262,706
113 262,701
D15— 6 262,707
106 262,709
262,710
112 262,711
133 262,712
D16— 08 262,713
30 262,714
42 262,715
262,716
D21— 13 262,717
262,718
262,719
262,720
262,721
262,722
262,723
25 262,724
41 262,725
262,726
54 262,727
59 262,728
89 262,729
198 262,730
D22— 1 262,731
18 262,732
D23— 71 262,733
165 262,734
262,735
262,736
D24— 12 262,737
17 262,738
25 262,739
28 262,740
99 262,741
D25— 92 262,742
D26— 80 262,743
D27— 36 262,744
42 262,745
D30— 15 262,746
D32— 21 262,708
D34— 29 262,695
D59— 2 B 262,747
D92— 1 W 262,748
D99— 34 262,749

CLASSIFICATION OF PLANTS

P.— 2 4,796
3 4,797
11 4,798
15 4,799
34 4,800
35 4,801
50 4,802
65 4,803
4,804
68 4,805
4,806
74 4,807
86 4,808
4,809
4,810

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,311,299
4,311,791
04 : 4,311,025
4,311,235
4,311,447
4,311,891
4,311,988
4,312,036
4,312,039
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06 : Re.30,848
4,310,928
4,310,929
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4,311,248
4,311,252
4,311,350
4,311,381
4,311,439
4,311,460
4,311,470
4,311,631
4,311,875
4,311,886

DESIGN PATENTS

04 : 262,687
06 : 262,679
262,691
262,694
262,702
262,705
262,727
09 : 262,665
17 : 262,671
262,704

262,729
18 : 262,667
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262,712
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262,718
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262,739
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262,708
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41 : 262,681
262,689
42 : 262,669
262,743
48 : 262,693
262,714
262,730
262,732
55 : 262,747

PLANT PATENTS

06 : 4,796
4,797

4,808
4,809

17 : 4,810
4,802

36 : 4,800
4,803

37 : 4,804
4,805

53 : 4,801

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